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British Society for the History of Pharmacy

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The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.
BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist.

Aims

Promotion of historical studies related to pharmacy.
Advancement of knowledge and propagation of understanding of the history of pharmacy.
Publication of the research work of pharmaceutical historians.
Preservation of pharmaceutical artefacts and historic pharmacies.
Support for the work of relevant museums and offering advice on establishment of other pharma-ceutical exhibits and on the preservation of pharmacies.
Co-operation with related professions and local historians on medico-pharmaceutical topics of mutual interest.

Pharmaceutical Historian

The *Pharmaceutical Historian* has been published since 1967, at first intermittently, but on a regular quarterly basis from 1972. Issues generally comprise 16 pages and cover.
An index for the years 1967-1995 was published in 1998. An index for 1996-2000 was published in 2000 and for 2001-2005 in December 2005.
Papers, short communications and letters in English on any aspect of the history of pharmacy are welcome and should be sent to the address above or by email to *bshpeditor@associationhq.org.uk*
Any illustrations are converted to monochrome for printing. Further details of requirements can be found on the website *www.bshp.org* under Publications.

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PHARMACEUTICAL HISTORIAN

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Note earlier starting time for meetings

Wednesday 19 May 2010

'Pharmacy and slavery: Apothecaries, medicines and the slave trade' by Dr Stuart Anderson. A joint meeting with the Faculty of the History and Philosophy of Medicine and Pharmacy, 6.00 at Lambeth. Tickets will be available later.

Wednesday 29 September 2010 tba

Wednesday 17 November 2010

'Horatio Nelson: his wounds' by Peter Warwick, President of the 1805 Society, 6.00 at Lambeth.

26-28 March 2010, BSHP Annual Spring Conference Best Western Diplomat Hotel, Llanelli.

Theme: **Pharmacy Practice and Practitioners**.

Sunday: After the AGM, a discussion on pharmacy practice 30/40 years ago, will be led by four speakers from community, independent and multiple, hospital and industrial practice. Think back to what you did during your FIRST YEAR of practice as a pharmacist and make a few notes to contribute to the discussion. We hope to record the discussion but please leave your dated (anonymous if you wish) notes with the organiser for a detailed report for the *Historian.* Bring your favourite pharmaceutical or medical joke to the Saturday dinner.

Letter

Dear Editor,

Prescription Charges

Given the mess of public finance at present it was timely of the *Historian* to produce a paper on prescription charges (Zozia and Zielicka, *Pharm Hist* 2009; 39 (4):59-64). The authors have cast their net wide but there is one omission, that of the scale of the first prescription charge in June1952 and its effect on the later structuring of script charges.The initial charge was one shilling (5p) per prescription form. This is explicitly explained in the RSPGB Info Centre Sheet of March 2009. It is questionable whether this definition was the result of poor drafting or a lack of understanding that many patients were prescribed multiple medication but its shortcomings were not without humour.

It was almost inevitable that some physicians would try to cram as many items as possible onto a single form either out of sympathy for the patient's financial circumstances or as a challenge to their own calligraphy. My recollected winning effort was a prescriber who squeezed l4 (fourteen) items on a single form. This cost the Chancellor a (predecimal) 0.85 pence per item and was attained in the days when extemporaneous prescribing was the rule. This calls into question the relevance of the authors' attempt to relate costs to the agricultural worker's wage. Such comparison only works post December 1956 when the basis was changed.

Four years after the Labour government's fumbling attempt to relate cost to supply the Conservatives chose to align charges to a more logical per item basis. Inevitably the increased cost was not merely a cost of living increase but a move to a more substantial contribution to medicine costs. This shifted the argument away from the rejection of 'care at the time of need' towards whether everyone should pay, whether some should be exempt and, if so, on what grounds. I suspect this argument is not yet over.

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9l London Street, Larkhall, S.Lanarkshire, ML9 lAQ
Telephone/Fax: 01698 881343 19 December 2009

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The Treatment of Syphilis in Ferrara (Italy) in the 19th Century: The Example of the Ferrarese Pharmacopoeia

Enrica Guidi [1], Lauretta Angelini [2], Donatella Mares [3], Carlo Contini [4] and Chiara Beatrice Vicentini [5].

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Summary

The authors have taken the Italian city of Ferrara as an example of the remedies against syphilis, commonly used worldwide in the 1800s. After having identified the terminologies used to diagnose syphilis, they evidence the legislative behaviours of the government authorities in 19th century in Italy and, in particular, the social and sanitary measures taken in Ferrara to limit the spread of the syphilis epidemic. Historical sources permitted description of the remedies employed in Ferrara from the beginning to the end of that century, not only to treat conditions linked directly to the malady itself, but also its complications and secondary pathologies. The pharmacopoeia written for the apothecaries of Ferrara by Antonio Campana, a famous Professor of Pharmaceutical Chemistry and Botany, won a great reputation and distribution in the international medical world not only of the first half of the 1800s. His authoritative work was much appreciated in Italy and abroad.

Key words: Prostitution, syphilis, regulations, remedies, pharmacopoeia, prevention, 19th century.

Introduction

Syphilis is an infectious disease predominantly transmitted by sexual contact. This illness, whose causative agent is a spirochaetal bacterium (*Treponema pallidum*), has over the years been commonly referred to as *lues* and numerous other names.

Unlike other infectious diseases, for example smallpox[1-3] or cholera[4-7], the multiplicity of names attributed to syphilis over the years has made research into the history of this disease rather complex. Nonetheless, the aim of this study was to investigate the historical origins of the term '*sifilide*', or syphilis, now used by the clinician to diagnose the disease. Thus, we set out to identify all the deaths attributable to syphilis between 1813 and 1899 annotated in the 'Register of Christian Deaths Occurring in Ferrara', preserved at the Historical Archive of the Municipality of Ferrara, as well as the various stages of the disease which afflicted these patients. Table 1 (p. 3) classifies these cases of syphilis into primary, secondary, tertiary and congenital[8] (see Appendix) and highlights the dates of appearance and disappearance of the terminology employed. It also identifies the absolute and relative frequencies of each term.

The expression first commonly used and adopted was '*tabe'*, tabes, (45.6%) followed by '*tabe senile*' (26.5%); these both appeared in 1813. The next most frequent term was '*sifilide congenita*', congenital syphilis (10.6%), which was employed for the first time in 1879. The expressions of longest duration were, in descending order, the following: '*tabe'* for 67 years; '*tabe senile'* for 49; '*sifilide'* for 22; and '*sifilide congenita'* for 20 years. As far as the stage of the disease is concerned, the most frequently reported was found to be tertiary syphilis, of which 845 cases (79.6%) were identified, followed by congenital syphilis with 171 cases (16.1%). Few cases of primary (3.7%) and secondary (0.6%) syphilis were documented.

Fighting Luetic Infection in Italy

In the nineteenth century the first country to create a model of administrative regulation of prostitution was France. The rules were important enough to be exported all over the world. There were three basic principles: the internment of prostitutes indoors; their inclusion in special registers; and the obligation of periodic health visits for women who exercised prostitution.[9]

In the first half of the 1800s, all over Italy police laws then followed that dictated the rules of behaviour of prostitutes. With the arrival of thr Cavour government, the 'Regulations of the national surveillance of prostitution'came into force on 1 April 1860 in all northern provinces, and in 1861 in the rest of Italy. The fundamental basis of the legislation was the health monitoring and behavioral requirements, including the prohibition of prostitution of children under 16 years, of dressing improperly, to be in a state of drunkenness, to look out of the windows or to stand on the doorstep, to stop or wait in public places or to commit indecent acts in public places, to say obscene words, to follow or lure passersby on the street by word or by signs, and to stay away from home without just cause after 8 pm. The rules also established the 'brothels' into two categories: those where the prostitutes lived and those in which they went to practise.[9].

On 29 March 1888 the Crispi government issued two decrees containing the 'Regulation on Prostitution' and the 'Regulations on prophylaxis and treatment of syphilitic diseases', which replaced Cavour's rules. The first regulation no longer focused the surveillance, as happened in the past, on the prostitutes, but on the hygiene conditions of places used for the exercise of the profession. The second regulation, recognising that syphilis was not only due to prostitution, abolished the Health Offices and replaced them with the public dispensaries. Instead of 'sifilocomi', the legislation also provided for the establishment of special 'dermo-syphilopathic' sections at civilian hospitals.

The last legislative statutory provision of the nineteenth century dates to 1891 with the 'Regulations

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Table 1. Terms used to describe syphilis in Ferrara in the 1800s.

TERM	Year of appearance	Year of disappearance	Absolute frequency	Relative frequency %
sifilide primaria			**39**	**3.67**
celtico	1816	1816	1	0.09
malattia sifilitica madre	1888	1888	1	0.09
sifilide	1817	1899	36	3.39
sifilitica	1879	1879	1	0.09
sifilide secondaria			**6**	**0.57**
lue secondaria	1870	1870	1	0.09
morte per affezione sifilitica	1893	1893	1	0.09
mughetto sifilitico	1897	1897	1	0.09
pemfigo sifilitica	1881	1881	1	0.09
pemfigo sifilitico	1883	1889	2	0.19
sifilide terziaria			**845**	**79.64**
anemia sifilitica	1891	1891	1	0.09
cachessia sifilitica	1881	1881	1	0.09
demenza paralitica sifilitica	1898	1898	1	0.09
diarrea sifilitica	1821	1821	1	0.09
lenta tabe	1851	1851	1	0.09
lue	1867	1867	1	0.09
lue celtica	1820	1867	3	0.28
lue sifilitica	1822	1861	2	0.19
lue terziaria	1871	1871	1	0.09
marasma sifilitico	1884	1884	1	0.09
sifilide cerebrale	1878	1878	1	0.09
sifilide delle ossa	1882	1882	1	0.09
sifilide terziaria	1851	1851	1	0.09
sifiloma multiplo del bulbo spinale	1887	1887	1	0.09
tabe	1813	1883	484	45.62
tabe celtica	1844	1852	3	0.28
tabe consuntiva	1843	1852	11	1.04
tabe cronica	1850	1850	1	0.09
tabe da sifilide	1863	1864	3	0.28
tabe dorsale	1859	1899	17	1.60
tabe generale	1853	1853	1	0.09
tabe nervosa	1856	1870	4	0.38
tabe senile	1813	1878	281	26.48
tabe sifilitica	1822	1879	21	1.98
tabe venerea	1842	1847	2	0.19
sifilide congenita			**171**	**16.12**
lue congenita	1856	1897	2	0.19
mughetto con oftalmia purulenta di s. congenita	1887	1887	1	0.09
oftalmia purulenta da s. congenita	1887	1887	1	0.09
sifilide congenita	1879	1899	113	10.65
sifilide costituzionale	1862	1893	4	0.38
sifilide della madre	1889	1894	3	0.28
sifilide ereditaria	1867	1899	14	1.32
sifilide infantile	1884	1885	2	0.19
sifilide materna	1899	1899	1	0.09
tabe congenita	1856	1856	3	0.28
tabe infantile	1850	1878	27	2.54

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Figure 1. Sant'Anna Hospital in the Nineteenth Century.

on prostitution in the interests of public order, public health and morality'.[9] Under this legislation the police control on women returned , so that in a case of refusal to submit to medical visits, they were considered infected and therefore they had to be hospitalised in healthcare facilities with complete and absolute segregation.[9]

Diffusion and prevention of syphilis in Ferrara

In the city of Ferrara, research into the efforts made to combat the spread of syphilis immediately highlighted the fact that the disease appeared early on, and that a considerable number of individuals were affected from each social class. In addition to promoting research, aided by the autopsies carried out on those mortally afflicted by 'The French Disease', the authorities established facilities dedicated to the treatment and hospitalisation of its patients. In Ferrara, as well as the *Sant'Anna* hospital (Figure 1), the hospital of *Santo Giobbe*, run by the 'Company of Charity', was set up in 1558.[10]

Intervention measures were targeted towards the world of prostitution, since transmission of the disease occurred through sexual contact. For example, in 1535, a noblewoman from Ferrara, Laura Beliardi, opened a shelter for reformed prostitutes. This was later transformed, on the orders of Cardinal Giovanni Moroni, into an Augustinian monastery dedicated to the Virgin Mary.[11] Subsequently, an initial attempt was made to eliminate the disease by expelling the prostitutes and their protectors from the city. Once eradication of the phenomenon proved impossible by these means, the prostitutes were limited to certain areas in an attempt to control its spread. The prostitutes were forbidden to leave these zones, except for certain days and times, and were forced to wear identifying clothing (in Ferrara a highly visible yellow ribbon). At the same time, orphan girls or those abandoned without adequate dowry were subject to supervisory measures.[10] These policies were continued throughout the following two centuries and form the basis of the health policies adopted in the 19th century.

A missive issued by the Prefect of the Department of the Lower Po (which included Ferrara), addressed to the Presidents of *Sant'Anna* hospital, documents the existence of a care facility for prostitutes.[11] The note informs us of the closure of this establishment as the Ministry of the Interior had decided to withdraw the Treasury's funding of its running expenses and ordered that the infected prostitutes be sent to *Sant'Anna* in order to 'prevent the disorder which would occur should their care not be provided for'. Thus, the expenses would be entirely the burden of the *Pio Luogo* I. The hospital presidents replied to the Prefect, informing him of their impossibility of caring for the infected prostitutes for both fiscal reasons and lack of available beds, and invited the Municipal Administration to support their decision. Then, on the 21st December 1807, a decree issued by Napoleon established the Congregations of Charity; this was the first serious government attempt to centralise activities which at one time were the province of religious orders, thereby giving them a more modern role.[13] In fact, Article 1 of the decree, affirms that 'charity is an attribution of the Ministry of the Interior' and no longer, as in the past, the preserve of the Church. On the 31st May 1813, The Prefect of the Department of the Lower Po, as representative of the Ministry of the Interior, sent the Ferrara Police Commissioner the 'disciplines' he should abide by.[14] Essentially, the norms were aimed at regulating the phenomenon of prostitution, obliging the Commissioner to educate streetwalkers and to keep them under observation, to draft a 'bill' of all brothels and a list of their relative prostitutes, to subject each prostitute to medical examination and to hospitalise those infected, and to tax brothels and both streetwalkers and prostitutes 'practising in the brothels'. Until July 1814, infected prostitutes were kept at the *Casa della Consolazione* care facility and the town council was charged with the expenses of their upkeep, as inferred from a note sent in January 1815 from the Congregation of Charity to the Government Delegate and the bimonthly accounts.[11] From August 1814, however, the burden of this maintenance returned to the government. The Congregation representative complains of the lack of reimbursement of expenses by both the council and the government, and, furthermore it communicates that the Congregation was no longer

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able to provide the upkeep of these patients. In February of the same year, the minutes record a meeting between the 3 representatives of the Sezione Ospitali and the *Podestà* (chief magistrate) which was held to discuss placement of the infected prostitutes detained by the police and the costs incurred by Ferrara town council for their treatment. The conclusions reached in this meeting were: that the infected prostitutes should be housed free of charge at the House of Consolation and that Ferrara Town Council would be charged with the cost of their board and medical expenses, namely the intervention of surgeons and nurses. The Congregation of Charity, on the other hand, was given the responsibility of keeping, as mentioned above, a bimonthly account of the costs incurred and a list, also bimonthly, of the women hospitalised. The tables reported: name and surname; place of birth; day of admission; duration of hospitalisation; and expenses incurred.

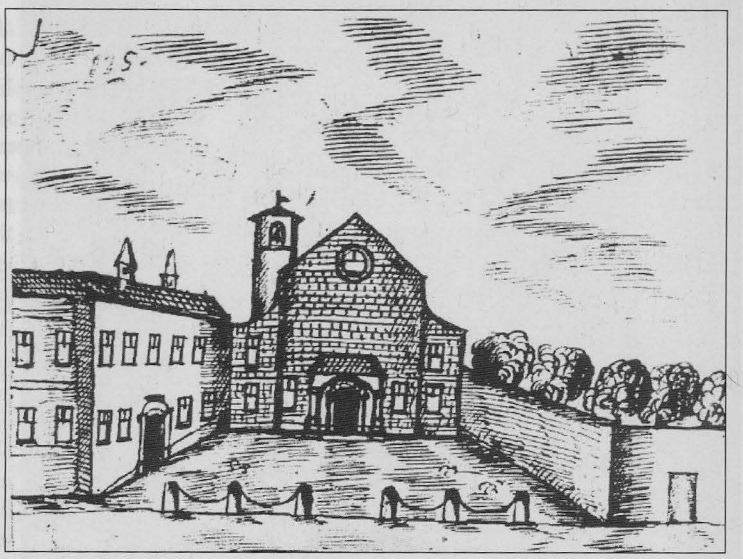

Figure 2. Santa Maria della Consolazione

Analysis of the six bimonthly reports (Table 2) found in the Ferrara Municipality Historical Archive (from May to September 1812 and from September to December 1813),[14] shows that, on average, 36 infected prostitutes were hospitalised in the House of Consolation every two months, at a daily cost of roughly 21 *lire* and a mean cost per woman of approximately 38 *lire*. The infected prostitutes detained by the police were treated at the *Casa della Consolazione* from 1807 to 1815. Unfortunately, no documentation regarding the fate of prostitutes, particularly those infected, is available in the subsequent period, up to 1832, when the Congregation of Charity, which ran the *Casa della Consolazione*, was suppressed. After 1833, young invalids and women of dissipated lifestyle were aided by the sisters of charity, better known as the Daughters of Charity of St. Vincent, and gathered in a *Casa* by a Mrs Barbantini. This *Casa* would later reveal itself to be too small for the ever-increasing number of patients, and was thus substituted by a larger one in the vicinity of the church of *Sant'Andrea.*[15] This latter shelter was named by Cardinal Della Genga as the '*Santa Maria Egiziaca* Shelter for the Converted and Converting'.[13] The charitable works of the Daughters of St. Vincent was aimed at 'saving from the greatest danger abandoned young women and recalling those led astray to a good and honest life'.[13] The subsequent cardinal (Ignazio Giovanni Cadolini), pressed by Mrs Barbantini and the city priests to deal with the many young people who, due to poverty or misfortune, abandoned themselves to every excess, accom-modated them, in July 1843, at the *Santa Maria della Consolazione* complex (Figure 2), which assumed the name of the 'Penitents of *Santa Maria della Consolazione'*, run from that moment on by the Daughters of Charity called to Ferrara from their headquarters at Modena.[13] The complex was exploited for this purpose until June

Table 2. Infected prostitutes held at the *Casa della consolazione.*

Bi-monthly period	N° of infected persons detained	Treatment expenses incurred in lire	Average cost in lire per patient	Average daily expenses
May/June 1812	41	1,271.34	31.01	20.84
July/August 1812	41	1,012.70	24.70	16.33
September/October 1812	35	1,082.99	30.94	17.75
November/December 1812	24	1,467.11	61.13	24.05
September/October 1813	38	1,669.95	43.95	27.38
November/December 1813	38	1,425.55	37.51	23.37
MEAN	36	1,321.61	38.21	21.62

Table 3. Remedies supplied from SS.Anna and Carlo Hospital to women detained in S. Maria house

Supplied remedies	Days of supply *	Supplied remedies	Days of supply *
Decozione Antivenerea	303	*Mercurio dolce*	29
Decozione Amara	111	*Zolfato di Zinco*	24
Decozione di Sabadiglia	95	*Carotto mercuriale Dose Duplicata*	7
Decozione China China	54	*China Gialla (Cinchona pubescens)*	7
Pillole di Cinoglossa	53	*Tintura Oppiata*	6
Impiastro di Pane e Latte	53	*China China (Cinchona officinalis)*	5
Decozione China China-Tintura Oppiata	51	*Mercurio Rosso precipitato*	2
Unguento Mercuriale Rosso	37	*Pillole mercuriali di Belloste*	1
Mercurio Solubile Moscati-Oppio	32		

*The number of days on which the remedy was supplied, without considering the number of doses (not always mentioned or inferrable).

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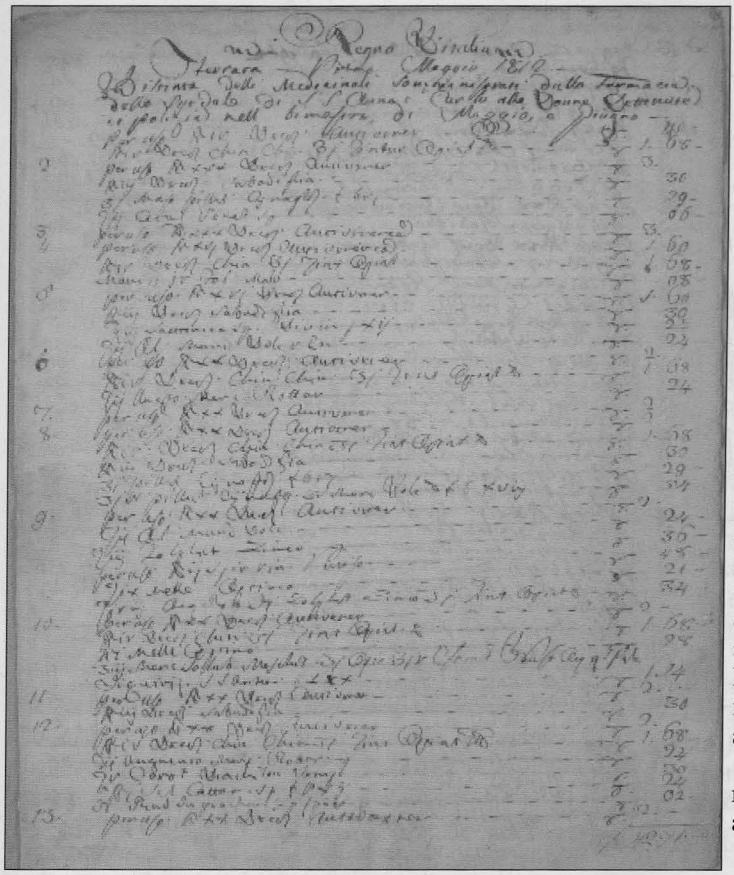

Figure 3. Original prescription of syphilis remedies supplied daily from SS. Anna and Carlo hospital to women detained in S. Maria della Consolazione in 1812.

Figure 4. Antonio Campana, Professor of Pharmaceutical Chemistry and Botany in Ferrara.

1865, when an outbreak of cholera caused it to be transformed into a *lazaretto* (quarantine hospital). After 1865, The *Sant'Anna* hospital only aided prostitutes equipped with a certificate of poverty free of charge; the others were sent by the local Office of Public Safety to the Modena syphilis hospital established by the government for the Emilia province.[16]

Syphilis in Ferrara in the 19th century: cure and remedies

At the end of the 15th century, once the disease started to spread over Europe, the first proposals as remedies from the most outstanding figures in this field (Leoniceno, Manardo, Paracelso, Brasavola) were mercury, guaiacum (*Guaiacum officinale*, holy wood) in the form of decoction or infusion and decoction of cinchona bark (*Cinchona* spp.). These had the aim of helping along the perspiration and expelling all the *umori cattivi* (typical theories of the time). Manardo also observed the symptoms of the illness as ophthalmia, dislocations, fractures, and fever leading to death.[10, 17]

Apart from guaiacum there were other remedies such as sarsaparilla (*Smilax medica*) and sassafras (*Sassafras officinalis*).

The discovery of a manuscript in the *Archivio Storico,*[14] reporting the remedies supplied daily from SS. Anna and Carlo Hospital to women detained (*Donne Detenute di polizia*) in *S. Maria della Consolazione*, is very important in outlining the remedies for syphilis and other connected pathologies in 1812 (Table 3, p. 5; Figure 3). As a guide to interpreting the remedies reported in the manuscript we chose the *Ferrarese Pharmacopoeia.* Antonio Campana, professor of Pharmaceutical Chemistry and Botany, (Figure 4) wrote the pharmacopoeia[18-21] for the apothecaries in Ferrara. From 1797 to 1841 a large number of editions had been printed which had been appreciated in Italy and abroad (Figure 5).

A careful analysis of the manuscript drew attention to a generic *Decozione antivenerea*. *Mercurio dolce* was recognised as calomel. *Mercurio solubile*, provided in pills or boluses, was the *Mercurio solubile del Moscati*, mentioned in the *Farmacopea ferrarese*. We think that *Unguento mercuriale rosso* was a version of *Unguento di precipitato bianco*, replaceable with *mercurio solubile*, *mercurio dolce* or *precipitato rosso*. *Pillole mercuriali di Belloste* had been supplied once, according to the manuscript, while *Cerotto mercuriale dose duplicata* was used sporadically.

Decozione antivenerea was not recognisable in Campana's contemporary Pharmacopoeia.[19-20] Before 1812 both *Decotto antivenereo del Pollini* (made of sarsaparilla and *Mercurio dolce*) and Pollini's powder were normally employed. The daily administration of *Decozione antivenerea* (full remedy: sarsaparilla and

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calomel) and a poor supply of mercurials oriented towards this remedy.

Decozione China and *Tintura oppiata* were employed as cure for fevers. The narcotic-sedative action of opium and the analgesic properties of morphine minimised syphilitic pains. *Decozione amara* was made up of willow and ash of willow tree (as cinchona substitute).

At the *Consolazione* a large amount of hound's-tongue pills (*Pillole di cinoglossa*, *Cynoglossum officinale*), zinc sulphate (*Zolfato di zinco*, for eye-congestion), and poultice of bread and milk (*Impiastro di pane e latte*) were also used. Different remedies such as *Decozione di sabadiglia* (*Veratrum sabadilla*) for stomach ache and purgatives were usually supplied.

In the 1841 Edition of Campana's Pharmacopoeia[21] there were a large number of mercurials, that were also employed with vegetable products such as sarsaparilla, guaiacum, sassafras, *mezzereon* (*Daphne mezereum*) and *dulcamara* (*Solanum dulcamara*, woody nightshade). As the doctors Vincenzo Bonora[17] and Angelo Bennati[22] wrote, mercurials were a good remedy against the syphilis (Ferrara, 2nd half of the 19th century).

Table 4. S. Anna Hospital statistical report (1871): Remedies employed for the 74 hospital patients

Remedies For Internal Use	**No. of patients**
Ioduro Potassico (potassium iodide)	40
Decotto antisifilitico del Salvatori	27
Pillole di Protoioduro di Mercurio	20
Pillole di Dzondi	14
Ioduro Potassico and/or *Tisana del Pollini*	10
Tisana or *Decozione del Pollini*	5
Liquore di Van Swieten	4
Bromuro di Potassio (potassium bromide)	3
Pillole di Deutocloruro di Mercurio	2
Sciroppo concentrato di Salsapariglia	1
Oppiacei (opium)	1
Acetato di Morfina (morphine acetate)	1

Remedies For External Use	**No. of patients**
Acqua vegetominerale	32
Unguento rosso / al precipitato rosso	27
Bagno generale	25
Pietra infernale	18
Impiastri di lino	18
Polvere di Calomelano (calomel)	14
Pomata di Belladonna sempl. o iodur.	11
Sublimato corrosivo soluz. (baths or local injections)	9
Polvere di Allume calcinato e Sabina	9
Unguento mercuriale	8
Pomata / Unguento di precipitato bianco	6
Cerotto mercuriale	5
Acqua emostatica di Pagliari	5
Decotto di Malva	5
Canelli di Argento nitrato (silver nitrate)	4
Acqua Fagedenica	4
Estratto di Belladonna	3
Unzione con linimento volatile	3
Cerotto di Vigo	3
Balsamo Podeldok	2
Tintura di arnica	2
Bagni generali termali	1

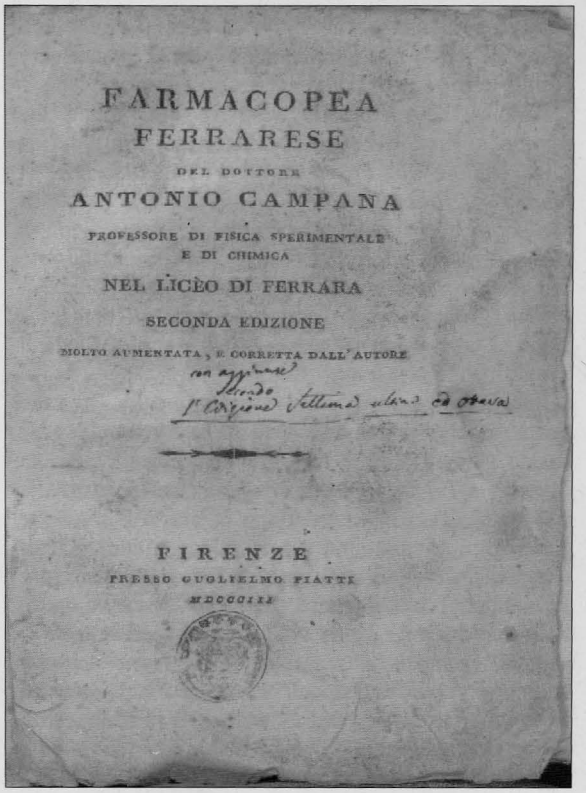
FARMACOPEA
FERRARESE
DEL DOTTORE
ANTONIO CAMPANA
PROFESSORE DI FISICA SPERIMENTALE
E DI CHIMICA
NEL LICEO DI FERRARA
SECONDA EDIZIONE
MOLTO AUMENTATA, E CORRETTA DALL'AUTORE
FIRENZE
PRESSO GUGLIELMO PIATTI
MDCCCXXX

Figure 5. Second edition of the *Farmacopea Ferrarese* 1830, written by Antonio Campana.

But vaccination failed: the mistake of Turenne and Sperino was to identify blennorrhagia as syphilis. In 1864, after the first hypodermic experiments with soluble compounds, Scarenzio started to inject insoluble mercurials.

Hypodermic, intramuscular methods with soluble or insoluble remedies and frictions with lotions or ointments had various supporters. Administration *per os* was not considered very efficacious, while intravenous injections of soluble mercurous compounds had a rapid efficacy.

At the beginning of the 20th century Bonora reported on *sublimato corrosivo* (mercuric chloride), potassium iodide and the *Antisifilitico del Pollini* (secret powders, not decoction), so that he could describe all the remedies in the 19th century's last decades in Ferrara. Scarenzio and Bennati practised mercurial injections successfully, in 1864 and in 1902 respectively.

According to a statistical report from St Anna Hospital, compiled by Alessandro Bennati in 1871 (*Resoconto statistico sanitario dell'Arcispedale per l'anno 1871 compilato dal dott. Alessandro Bennati, medico Direttore),* mercurial injections were not used in Ferrara.[23] Both the Medical and Surgical Division's data (male and female) had been reported in it. The main remedies in Ferrara around 1871 are clearly outlined in Table 4. Potassium iodide was utilised very often, also together with *Tisana* or *Decozione del*

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Pollini. The use of *Sciroppo di Salsapariglia* and opium, *Decotto Antisifilitico del Salvatori*, that is very similar to the one of Pollini were also reported.

Among the mercurials we have also found the *Liquore di Van Swieten*, mercurous or mercuric chloride pills (*Pillole di Protoioduro* or *Deutocloruro di mercurio*), *Pillole antiveneree di Dzondi*, made of *sublimato corrosivo* (mercuric chloride). *Unzioni di Belladonna semplice* or *iodurata*, *Unguenti mercuriali*, *Unguento rosso*, *Balsamo Podeldok* added to *Tintura di arnica* (*Arnica montana*) and *Bagni generali* (baths) for external use were usually applied in the Medical Department.

Seriously ill patients were treated surgically. After the operation, men were cured with *Acqua vegetominerale* (made of lead acetate and lead oxide) and *Fascette bagnate nell'Acqua emostatica di Pagliari* (haemostatic bandages). They also used to sprinkle *Polveri di allume* (made up of aluminum potassium sulfate). Other treatments were cauterisation with *Pietra infernale* (dry silver nitrate) or coating dressings with *Unguento rosso*.

To avoid scars *Cerotto di Vigo* was used instead of sutures. Phimosis was treated in the same way by adding preputial injections of mallow (*Decotto di malva*, *Malva sylvestris*), as well as by bathing with applications of the same decotion or of *Acqua vegetominerale*. Linseed poultices (*Impiastri di lino*, *Linum usitatissimum*) and ointments (*Unguento mercuriale*) were often used.

In the women's Surgical Department simple washing with a local bath of *Sublimato corrosivo* solution or *Acqua vegetominerale* was suggested.

In the 19th century mercury was still often used, even if in smaller and rational doses as the side-effects and its toxicity started to be evaluated. Nevertheless in the 20th century the new effective treatment with penicillin was discovered.

Conclusions

Syphilis occupies a special place in the history of humanity, as it has neither provoked catastrophic peaks in mortality nor influenced economic development.[24] In fact, historic demography testifies that the number of deaths due to syphilis is almost insignificant in comparison to the epidemics of the bubonic plague (1575-77). However, its indirect effects on demographic trends should not be ignored: it has determined falls in birth rates and increased the frequency of infant mortality, as well as the general death toll, by effect of organic damage which predisposes the infected person to other illnesses.

It is almost impossible to perform epidemiological studies or accurate statistical analyses on the historical status of syphilis as the diffusion characteristics, diagnoses and treatment of this disease varied from place to place. Another cause of difficulty is the nature of the disease itself, whose appearance had to be hidden to preserve honour and familial integrity. In consequence, the vast majority of infected persons sought no medical assistance, and instead relied on self-medication; furthermore, if medical intervention occurred, the lack of obligation of practitioners to disclose new cases throughout the 19th century kept the disease out of statistical records.

Another difficulty encountered in the study of syphilis is the variety of terms used in diagnosis (for example *tabes dorsalis*, *tabes nervosa,* and syphilitic thrush), probably due to the multiplicity of clinical manifestations or the 'prudery' of the time, when syphilis was considered an indicator of reprehensible social behaviour.

Nevertheless, it can be inferred that the provisions adopted by the authorities in the attempt to curb the spread of this disease were limited to focussing on the principal vehicle of contagion, namely women practising as prostitutes or those who, due to their social status (orphans or abandoned without adequate dowry) could be drawn into prostitution, i.e. regulation of prostitution and medical checks of these women. At the end of the century, the failure of this health project appears evident, and was presumably jeopardised by the serious imbalance in the doctor/patient relationship. In fact, the physician was seen by the prostitutes not as healer but as a controller who had the power to confine them to a hospital or syphilis hospice. Analysis of the historical sources reveals that in the first half of the 19th century the disease only seemed to strike prostitutes because infected men did not turn to health facilities and preferred to treat themselves at home. Only in the second half of that century, after the advent of surgical treatment, did the infected men begin to exploit the hospital wards.

Throughout the entire century, management of syphilis was of fundamental importance: in the 1800s the disease was treatable but not curable.

In this paper, the northern Italian city of Ferrara was taken as an example as it was the birthplace of the authoritative Antonio Campana, who wrote a pharmacopoeia which had several editions from 1797 until 1841. The Ferrarese Pharmacopoeia was not addressed only to the apothecaries of Ferrara, but won a great reputation and international distribution. In this city, the remedies adopted in the second half of the century were in line with those of the international medical world. The Ferrarese Pharmacopeia has provided us with an impression of the medical world in Ferrara in the early 1800s. This source was indispensible for us in understanding the manuscript from *Santa Maria della Consolazione*, which reported the list of remedies administered at the *Sant'Anna* and *Santo Carlo* hospitals.

The discovery of the statistical accounts for the *Sant'Anna* hospital in 1871, written by Alessandro Bennati, a historical document which complements the tracts published by the Ferrara physicians Vincenzo Bonora and Angelo Bennati, enabled elucidation of the methods of treating syphilis in the second half of the century.

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Appendix

The clinical progression of syphilis is generally divided into 4 stages: primary, secondary, and tertiary syphilis and congenital lues.

PRIMARY SYPHILIS: The period of incubation after contagion lasts three weeks on average. Roughly forty-five days after contagion, following this first asymptomatic phase in which the bacteria actively replicate inside the organism, the first clinical manifestations occur (primary syphiloma). In substance, this is a small painless lesion which appears in the area of contagion (penis, vagina, mouth, mammary areola, anus or rectum). Primary syphiloma is a hard, reddish-coloured pustule of approximate diameter 1 cm. It does not normally itch and does not cause pain, but soon becomes ulcerous. Thus a small, smooth and copper-coloured chancre is formed which heals spontaneously in around 25-45 days.

SECONDARY or DISSEMINATED SYPHILIS: Once the primary syphiloma has healed, a diffuse skin rash appears, accompanied by fever and swelling of the lymph nodes. Erythematous syphiloderms (small red marks known as rose spots) appear on the mucous membranes and especially on the skin of the upper limbs and trunk; they are non-itchy and spread over the entire body surface for a period of approximately two months. Piliferous follicles may also be involved, leading to alopecia and thinning out of the eyebrows. The infection may also be associated with fever, meningitis, general malaise, loss of appetite and headache; these symptoms normally disappear spontaneously after a few days or up to eight weeks later. The period spanning contagion to the end of the secondary stage is termed recent syphilis, and can last for as little as 60 days or for one or two years. Upon completion of this phase, the disease may spontaneously resolve itself (in approximately one third of cases), become latent, or evolve into a more severe third, or *TERTIARY* stage (roughly a third of cases).

The third and final phase of the condition, known as late or tertiary symptomatic syphilis, is characterised by cutaneous and/or visceral, as well as cardiovascular and nervous, symptoms. These manifestations, generally contained but rather damaging, may also involve the digestive apparatus, the skeleton, the ear and the tongue, causing, in the most serious cases, death of the individual. Finally, when the disease is transmitted from the mother to the foetus in utero or during parturition, the disease is termed *congenital* syphilis.

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Aromatic vinegars: antiseptics of the past

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Infectious diseases have always been dangerous for people. In the past, epidemics with high mortality rates were unpredictable and therefore exceedingly frightening. Different understanding in the history of the cause-and-effect chain led to different methods of treatment and prevention.

For hundreds of years, infectious diseases and subsequent epidemics have been thought to be caused through inhaling the so-called 'miasma', an effluvium of foul air or bad vapours. Therefore people attempted to avoid such morbid air or at least to improve the infernal smell of ubiquitous rot. Aromatic woods, herbs and incense were burnt, perfumes and scented preparations with essential oils were used in many cases for deodorising, hoping to control the expansion of epidemics.

In medieval times, superstition, astrology and religious explanatory models had a great impact on the fight against epidemics. Prayers, sacrifices and pilgrimages were exercised as well as humoral pathology treatment. Physicians administered diets and a moderate lifestyle to restore a predisposed body against infection. Sick people were treated with purgatives and phlebotomy to remove the 'infectious poison'.

In the course of time people realised that sick persons or animals and contaminated goods could also spread infectious diseases. Therefore, quarantine sanctions and disinfection techniques became the most important methods in the fight against the invisible fatal 'contagion', which passed indefinably from one sick person to the next. Before the development of modern disinfection and antibiotics, medicinal vinegars were important compositions to avoid infections in times of epidemic.

Historic roots of medicinal vinegars

In ancient times vinegar was used as a cooling agent when febrile infections affected people. It was used as a gargle or an anti-inflammatory compress. The use of vinegar prepared with fragrant herbs reflects hundreds of years of experience and can also be traced back to antique works. The application of vinegar containing thyme, rue, pennyroyal or lavender was described by the famous Greek physician Pedanius Dioscorides of Anazarbos (1st century) in his famous work 'De materia medica'.[1]

Rue belongs to the *Rutaceae* plant family like citrus fruits and contains an essential oil with a characteristic odour. Rue especially was thought to have great virtue against poison and the bites of poisonous animals and therefore was often used as an ingredient of antidotes, remedies against any kind of intoxication.[1] The famous Persian physician Abû Bakr Muhammad ibn Zakariyâ Râzî also known as Al-Razi, Ar-Razi or Rhazes (865–925) recommended vinegar preparations with rosewater and other aromatic herbs to prevent smallpox.[2]

Comparable remedies can be found in plague treatises of the 14th century in which the frequent application of fragrant herbs like sage, wormwood, laurel, juniper berries, cardamom, cloves, nutmeg, garlic or ginger, but in particular the use of rue and vinegar was often advised.[3]

In the treatise *Consilium de peste* (1448) dealing with the plague, the medieval Italian physician Saladin Ferro of Ascoli (15th century) referred to the great Persian physician Avicenna (980–1037) who had emphasised the virtue of fragrant fruits like citrus as prevention against the pestilential air. Moreover, Saladin suggested a mixture of rosewater and vinegar for sprinkling rooms, and for washing the face and nose and also recommended that a little flask with rose vinegar should be carried for sniffing. Additionally he believed in the flavoursome scent from drugs like melissa, marjoram, wormwood, sage, mint, rosemary and pomanders – balls prepared with resins and fragrances – to clean the foul and morbid air.[4]

When in 1720 a plague epidemic arose in Europe, Richard Mead (1673–1754), a celebrated fellow of the Royal College of Physicians, edited a booklet about methods for preventing the pestilential contagion. In it he still referred to Ar-Razi's advice concerning the prevention of infection by keeping houses airy and clean, purifying and cooling them with water, vinegar and according to the principles of the humoral pathology with 'cool' herbs like roses, violets and water-lilies. Furthermore Mead followed Rhazes' method to take frequent acid fruits like pomegranates and lemons and in particular 'cool' wine-vinegar in small quantities rendered with 'hot' aromatic ingredients like 'gentian root, galangal, zedoary and juniper berries' to protect oneself against infection.[5]

So vinegar and fragrant preparations containing essential oils obviously had a particular importance in the practice of combating infectious diseases.

Aromatic vinegars in herbals and dispensatories

Vinegar formulations with scented herbs also form part of the famous herbals by Pietro Mattioli (1501–1577) and Jakob Theodor Tabernaemontanus (1522–1590). *Acetum Rutae* and *Acetum florum Caryophyllorum*, vinegars prepared from rue or clove, were applied to protect against plague infections.

As many European dispensatories like the *Pharmacopoeia Brugensis* (1697), the *Pharmacopoea Wirtenbergica* (1741) or the *Pharmacopoea Leodiensis* (1741) show, numerous herbs containing essential oils were used for preparing compound vinegars in the 17th and 18th century. Such vinegars were denoted *Acetum Bezoardicum*, *Acetum Theriacale*, *Acetum Pestilentiale* or *Acetum Prophylacticum* indicating their use against poison and treatment and prevention of infectious diseases.

Obviously, the compound vinegars played an important role as remedies in the pharmacy. Some of their

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ingredients like rue, sage, gentian root, angelica, burnet saxifrage, tormentil, laurel, lemon peel, juniper berries and others were considered to be 'antidotes' and to have healing power against poisons and 'contagions'.

Physicians attending the sick and people who had to visit infected places used aromatic vinegar as a protecting agent. Sponges soaked with aromatic vinegar in little perforated boxes – so-called 'vinaigrettes' – for sniffing became quite common. These elaborate little containers were often made of silver and replaced the extremely expensive and precious pomanders like the *pomum ambrae* prepared with resins and essential aromatic oils, which had been very popular against morbid air and served as infection prevention in medieval times.[6]

The Vinegar of the Four Thieves

In the 18th century a special aromatic vinegar formulation gained very great popularity. This composition was included in the *Codex Medicamentarius seu Pharmacopoea Parisiensis* (1748) denominated as 'Acetum Anti-Septicum, vulgo des Quatre Voleurs' (Vinegar of the Four Thieves). For its preparation, wormwood, rosemary, sage, mint, rue, lavender, garlic, calamus, cinnamon, cloves, nutmeg, and an essential oil containing herbs were macerated in vinegar for twelve days. After filtration the herbal vinegar was treated with camphor dissolved in alcohol. 'Antiseptic' meant

Figure. 1: Apothecary's bottle for aromatic vinegar.

'antifouling' at that time and was far away from the modern definition. The Scottish physician John Pringle (1707–1782) implemented hygienic measures in the Army in the mid-18th century, including methods to combat hospital infections and he experienced notable advances in septic and antiseptic substances such as affirming the antifouling effectiveness of different herbs, acids, camphor and distilled spirits.[7]

The 'Vinegar of the Four Thieves' was said to have been used by four bandits during a plague in Marseilles to protect themselves from the disease while robbing the sick and the dead. It was said that even though they entered houses of dying people they were immune against the plague and could plunder the houses and corpses without getting infected. They repeatedly washed their hands, nose and mouth with this special herbal vinegar.[6] The same recipe was then listed in 1753 as 'Vinaigre contre la peste, ou des quatre voleurs' in the *Pharmacopoée Royale Galenique Et Chymique*.

The 'Four Thieves Vinegar' was not only noted in pharmaceutical literature. The use and preparation of the 'Vinaigre des Quatre Voleurs' or 'Acetum quatuor latronum' was described for instance in the famous *Diderot's and d'Alembert's Encyclopedia* (1765).[8]

Eventually the formulation became popular in England as well. In 1774 the medical practitioner and surgeon Georges Arnaud de Ronsil (1698–1774) in London promoted the use of 'Dr Arnauds Vinegar of the Four Thieves'. He wrote that this vinegar was adopted by the physicians who examined the sick in the Plague at Marseilles and promised to procure this 'wonderful protecting remedy' from Marseilles. The 'Vinegar of the Four Thieves' was to be used by all people who had to haunt infected places and attend people at risk of death. He also recommended this vinegar to purify malignant air in enclosed and crowded places like churches, prisons, hospitals, ships and places of amusement.[9]

By this time comparable vinegar compositions were included in different European dispensatories. In 1799 the *Pharmacopoea Borussica* contained 'Acetum Aromaticum' instead of the formerly listed 'Acetum Bezoardicum' and 'Acetum Prophylacticum'. It was composed of wormwood, rosemary, sage, mint, cinnamon, cloves and nutmeg, very similar to the French 'Acetum Anti-Septicum, vulgo des Quatre Voleurs', but it did not contain rue, garlic or camphor.

In 1817 the *Pharmacopoeia Edinburgensis* listed the 'Acidum Aceticum Aromaticum' prepared with rosemary, sage, lavender, cloves and diluted acetic acid.

While vinegar preparations gradually lost their relevance in the pharmacy and diluted acetic acid replaced the vinegar, the formulation of the 'Vinegar of the Four Thieves' was still mentioned in some cosmetic books and common encyclopedias, for instance in 1805 by Johann Bartholomaeus Trommsdorff (1770–1837) in his cosmetic book *Kallopistria,*[10] in 1854 in Johann George Krünitz's *Oeconomic Encyclopedia,*[11] in 1857 in William Septimus Piesse's *Art of Perfumery,*[12] and in 1872 in Dick's *Encyclopedia of practical receipts and processes,* prescribed as 'Marseilles Vinegar'.[13]

'Acetum Aromaticum' containing essential oils of juniper, lavender, mint, rosemary, citrus and clove and prepared with diluted acetic acid instead of vinegar was used to protect from any infection until the mid 20th century. Hands and mouth should be washed, and hot bricks were sprayed with aromatic vinegar to provide 'disinfected' and fragrant air in sickrooms.

'Acetum Aromaticum' was finally replaced by disinfectants like chlorinated lime, sodium hypochlorite and formaldehyde for rooms and chlorhexidine for the mouth.

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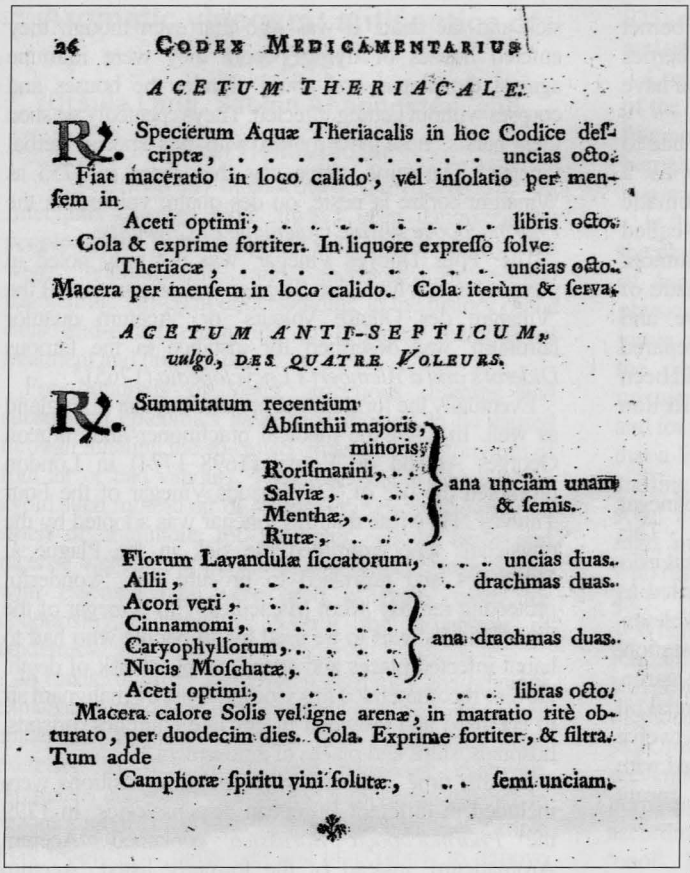

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ACETUM THERIACALE.

℞. Specierum Aquæ Theriacalis in hoc Codice deſcriptæ, ... uncias octo.
Fiat macératio in loco calido, vel infolatio per menſem in
Aceti optimi, ... libris octo.
Cola & exprime fortiter. In liquore expreſſo ſolve
Theriacæ, ... uncias octo.
Macera per menſem in loco calido. Cola iterùm & ſerva.

ACETUM ANTI-SEPTICUM,
vulgò, DES QUATRE VOLEURS.

℞. Summitatum recentium
Abſinthii majoris,
minoris,
Roriſmarini, . . .
Salviæ, . . .
Menthæ, . . .
Rutæ, . . .
} ana unciam unam & ſemis.
Florum Lavandulæ ſiccatorum, ... uncias duas.
Allii, ... drachmas duas.
Acori veri, ...
Cinnamomi, ...
Caryophyllorum, ...
Nucis Moſchatæ, ...
} ana drachmas duas.
Aceti optimi, ... libras octo.
Macera calore Solis vel igne arenæ, in matratio ritè obturato, per duodecim dies. Cola. Exprime fortiter, & filtra. Tum adde
Camphoræ ſpiritu vini ſolutæ, . . . ſemi unciam.

Figure 2: Recipe for 'Vinegar of the four thieves' from Boyer (ed.) *Codex medicamentarius*.[15]

Effectiveness of aromatic vinegar as disinfectant?

Being known for centuries, aromatic vinegars like the 'Vinegar of the Four Thieves' were precursors of modern disinfectants. Microbiological studies have shown that vinegar and acetic acid could actually have activity against bacteria in vitro. Standard wine vinegar with 5 per cent acetic acid and also acetic acid in a concentration of 1 per cent were tested for antibacterial effects against *Proteus mirabilis, Pseudomonas aeruginosa* and *Staphylococcus aureus* with good results.[14]

Vinegar was both an extracting medium and a carrier for the active ingredients of the fragrant herbs with their particular properties, as well as an antiseptic remedy. The addition of aromatic herbs containing disinfecting substances presumably contributed to the effectiveness of the preparation.

It is probable that vinegar blended with essential oils of clove and citrus could also serve as an effective repellent against fleas and lice that could pass on the plague.

It seems to be notable that possibly useful prevention and disinfection methods started long before any exact knowledge about microbiology had developed. To some extent the 'Vinegar of the Four Thieves' or the 'Acetum Aromaticum' can be regarded as an effort to provide potentially effective disinfectants eventually relying on an ancient, empirical tradition. Aromatic vinegars thus can be considered as reasonable antiseptic agents of past times when methods of sterilisation and antibiotics were unknown.

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The Quest for Reciprocal Recognition of Colonial Pharmaceutical Qualifications 1896 to 1914

Stuart Anderson

As the British Empire expanded during the nineteenth century large numbers of people left England to start new lives in the colonies around the world, including many chemists and druggists. But the numbers migrating could not meet demand, and the colonies began to run their own courses for local people. In time some of these locally qualified individuals expressed a wish to practice in Britain. This development raised difficult issues not only for the Pharmaceutical Society of Great Britain but also for pharmaceutical bodies overseas.

British pharmacists in the colonies

Before the foundation of the Pharmaceutical Society in 1841 the pharmaceutical qualifications of those who went out to the colonies varied considerably, if they had any at all. Some were apothecaries, whilst others described themselves as 'chemists and druggists' but had no formal qualifications. In reality it mattered little, because in most colonies there were no laws or regulations relating to the practice of pharmacy or the control of poisons, and anyone could set up a pharmacy business.

The situation differed enormously between the various colonies and dominions. In India, one of the first British pharmaceutical practitioners was a Scottish chemist called Bathgate, who opened a chemist's shop in Calcutta in 1811.[1] He was followed by a trickle of others, which turned into a stream following the start of the British Raj in 1857.[2] Initially the Australian colonies consisted largely of criminals who had been transported from England. One such was John Tawell, who in 1820 became the first person to be recognised as an apothecary by a local medical board anywhere in the empire.[3]

Many colonies began to develop their own arrangements for pharmacy education and registration, usually based on the British model. Pharmaceutical instruction in British India began in 1860, when occasional pharmacy classes were started at Madras Medical College.[4] Registration came much later. Different arrangements existed in the various Australian states: in Queensland the registering body for pharmacists was originally the Medical Board, which later set up a Register of Chemists and Druggists, the first entry being October 1861.[5] The state of Victoria had established a Pharmaceutical Register by 1877.[6] In Canada progress varied from province to province, with both Montreal and Ontario establishing pharmaceutical societies in 1867.[7]

Until the end of the nineteenth century those colonies that had them accepted British qualified pharmacists onto their registers. This was not, however, reciprocated in Britain. As the numbers of those who had qualified as chemists and druggists in their own countries increased, so the issue of recognition of colonial qualifications by the Pharmaceutical Society rose to the fore.

The quest for recognition of colonial qualifications

The Society took the initiative in 1896. It sent letters to pharmacy officials at the outposts of empire on the matter of imperial reciprocity. The issue generated considerable interest. In Australia and elsewhere it drew attention to differences between individual colonies. But it was pharmacists in Canada who made the next move, by seeking 'an interchange of certificates' between themselves and the Pharmaceutical Society of Great Britain. This was discussed by the Society's Council in January 1897.

The Council's decision produced a flurry of activity. The editor of the *Chemist and Druggist* sent a hand-written letter dated 22 January 1897 to pharmaceutical bodies across the empire. It began 'At the meeting of the Council of the Pharmaceutical Society of Great Britain held last week, an application was made by the Pharmaceutical Association of Quebec for an interchange of certificates, which application had to be declined because no power is given by the British Pharmacy Act for such interchange ...' [8]

The *Chemist and Druggist's* letter posed a number of questions concerning acceptance of the certificates and the credentials of other bodies, and it included questions about the desirability of a London conference to discuss these issues. In Australia the letter generated considerable correspondence between the pharmaceutical bodies of the various states, not least because at that stage the colonies were not recognising each other's qualifications.

The issue for Australian pharmacists was whether they should work first towards Australian or Australasian reciprocity before considering an exchange of qualifications with 'the parent society.' This approach prevailed, and a letter was sent from the society in Fremantle to that in Brisbane in February 1897. It read 'I am directed to inform you that this society desires to support your efforts to promote reciprocity with Great Britain, and we are of the opinion that reciprocity should be established throughout Australasia before we approach the Mother Country.'

Internal Australian differences clearly needed to be resolved before pursuing reciprocity with Britain. The letter criticised another colony where the highest standards were insisted on and suggested reciprocity based on existing examinations. 'Will the Old Country' it argued 'admit Australians when Australians will not admit each other to their respective provinces?'[9] It was a question that was at the heart of the reciprocity argument.

Enabling reciprocity

The obstacle to mutual reciprocity identified by the Pharmaceutical Society, that it did not have the legal powers to do so, meant that the issue could be deferred indefinitely. New legislation would be required, and this could take years. The need for a new Pharmacy and

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Poisons Act was already acknowledged,[10] and the recognition of colonial qualifications could be covered in a schedule to the new Act. In the meantime the colonies received a steady stream of requests from London for pharmaceutical information. Australians along with other colonist were asked to comment on the proposed Indian and Colonial Addendum to the *British Pharmacopoeia* of 1898.[11]

The delay provided an opportunity for colonies to explore mutual recognition with each other. In July 1901 New South Wales proposed an internal conference on reciprocity, which was promptly rejected by the Victorians. But New South Wales eventually took unilateral action by indicating that it was prepared to register 'all persons on the current registers of the various states at once, recognizing only those who had passed a preliminary examination, served an apprenticeship of at least three years, and also passed examinations…'[12] Letters of support were received from the other states; an implementation date of February 1903 was agreed, but nothing happened.

Back in Britain work continued on a new Poisons and Pharmacy Bill. The mechanism for achieving reciprocal recognition of pharmaceutical qualifications was to be through Section 4 of the new Act. The Pharmaceutical Society would be 'empowered to make byelaws establishing a curriculum, dividing the examinations, and making provisions for the acceptance, for registration in lieu of examination, of colonial diplomas'.[13] This part of the Act underwent amendment as it went through the Commons. It was then taken through the House of Lords by the Earl of Crewe, the Lord Privy Seal and Secretary of State for the Colonies. Hansard reported it as follows;

> The Commons Amendment to paragraph (b) of Clause 4—(b) Providing for the registration, upon payment of the prescribed fee, as pharmaceutical chemists or chemists and druggists under the Pharmacy Acts, 1852 and 1868, without examination, of any persons holding colonial diplomas or of qualified military dispensers who produce evidence satisfactory to the council of the society that they are persons of sufficient skill and knowledge to be so registered, is to insert, after the word "dispensers," the words "or certified assistants to apothecaries under the Apothecaries Act, 1815." This simply increases, to some extent, the discretion of the Pharmaceutical Society as to the persons they may recognise under their by-laws. It is considered that without the Amendment there would be some hardship.[14]

The Bill was agreed and became the Poisons and Pharmacy Act 1908. But the Society was in no hurry to implement the bye-law, not least because of its reservation about the qualifications being awarded in some of the colonies. Local authorities tried their best to maintain standards, but this was often an uphill struggle. The Colonial Pharmacy Board in Cape Colony, South Africa, meeting in 1908, expressed regret that 'so many candidates came up for examination without any apparent preparation.' [15]

The tardiness of the Society on the issue was raised in the House of Commons in 1911:

> In the House of Commons on Monday this week Captain Craig asked the Home Secretary whether byelaws had yet been made by the Pharmaceutical Society under the Poisons and Pharmacy Act 1908 Section 4(b). Mr Churchill writes in reply: I am informed that before formulating any byelaws under Section 4(b) of the Poisons and Pharmacy Act 1908, the Pharmaceutical Society of Great Britain has to dispose of certain preliminary questions connected with the educational curriculum of pharmaceutical chemists and druggists, and that the Society is now actively engaged in those questions.[16]

Implementing reciprocal recognition

Over the next two years the Society duly considered the relevant educational curriculum and the procedures necessary to implement the byelaw. A note spelling out the details for 'pharmaceutical registration in the British Empire' finally appeared in the *Pharmaceutical Journal* in August 1913.[17] Twelve months later an updated version covering the whole world appeared under the title 'pharmaceutical registration abroad'.[18]

The fact that it took four years to implement the bye-law was largely due to the diversity of pharmacy education, examination and registration arrangements in the countries of the empire.[19] The situation was changing rapidly. By 1914, some Australian states had agreed reciprocity of the whole register, but for others there was reciprocity just on an examination basis. Only the two states with colleges of pharmacy, Victoria and Queensland, had reached agreement with the Pharmaceutical Society of Great Britain on reciprocity. But with the outbreak of the First World War in 1914 any further progress in this area came to an abrupt halt.

The Pharmaceutical Society was to grapple with the issue of reciprocal recognition for many years to come. In the 1950s Britain was to exercise great influence over pharmacy education and standards in the Australian states by threatening to withdraw its reciprocity agreement.[20]

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In space and on the moon: Mankind's most remote pharmacies

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In 2009, the world celebrated the 40th anniversary of the first men landing on the moon. On July 20th, 1969, Neil Alden Armstrong (*1930) and Buzz Aldrin (born Edwin Eugene Aldrin, Jr., 1930) set their feet into the moon's dust. The exploration of the cosmos by men has always been closely linked to medicine, as the unique requirements of weightlessness and heavy acceleration forces are risk factors during the missions. Therefore, all space travellers were equiped with medical kits carrying a variety of drugs. These medical kits might be seen as the most remote pharmacies in history.

A brief chronology of the space race

The exploration of space is one of the greatest challenges mankind has met in the 20th century. In the 1950s and early 1960s, the Soviet Union led the space race and took the first animals and humans beyond earth's gravity. Yuri Alexejewitsch Gagarin (1934-1968) was the first human to orbit the earth. This was on April 12th, 1961. The flight took 108 minutes and one of Gagarin's tasks was to eat something out of a tube. Scientists wanted to know how the human body reacted in weightlessness and learned that untrammeled swallowing, eating and drinking was possible in space.

On June 16th, 1963 the first woman cosmonaut was Valentina Vladimirovna Tereshkova (*1937). In August 1961, Gherman Stepanovich Titov (1935-2000) became the first to orbit the earth for longer than 24 hours and Alexei Arkhipovich Leonov (*1934) managed the first spacewalk on March 18th, 1965. The Russian Space Agency also launched the first multiple crew, three men on October 13, 1964.

In the 1960s, the United States started to catch up. From 1961 to 1963 the Mercury program took 6 astronauts in one-man capsules into space. Starting in this program, the National Aeronautics and Space Administration, NASA, collected and closely monitored many medical data of the astronauts during the missions, for example the heart rate, electrocardiograph, respiratory rate, blood pressure, or the body temperature using a rectal thermometer[1].

Project Gemini was the second human spaceflight programme of NASA, with 10 manned flights occurring in 1965 and 1966. The major objectives were:

- To subject two crewmembers and supporting equipment to long-duration flights, a requirement for projected later trips to the Moon or deeper space.
- To effect rendezvous and docking with other orbiting vehicles, and to manoeuvre the docked vehicles in space, using the propulsion system of the target vehicle for such manoeuvres.
- To perfect methods of re-entry and landing the spacecraft at a pre-selected landing point on earth.
- To gain additional information concerning the effects of weightlessness on crew members and to record the physiological reactions of crew members during long-duration flights.
- To accomplish Extra Vehicular Activity (EVA), meaning space-walks outside the protection of the space craft.

Medical challenges in space

Although the Soviets as well the Americans only sent highly trained, well prepared, healthy military test pilots, health was an issue.[2] This is due to the special conditions in space. The first one is weightlessness. Many space travellers suffer from motion sickness. The body fluid migrates from the extremities into the head. That is why astronausts have puffy faces and look like they spent a holiday with a good-cooking grandmother.

But another problem aeromedical experts had to take care of was the effect on the human body of the heavy acceleration and deceleration forces, called 'g-loads', building up during rocket-propelled flights into space at speeds far greater than those yet experienced by man. Nausea and disorientation are the main problems.[3] Many fighter pilots in the Second World War had suffered momentary pain and blurred vision during 'redout', when blood pooled in the head and eyes during an outside loop, or 'blackout', when the heart suddenly could not pump enough blood to the head region as an airplane pulled out of a steep dive. Acceleration of a vehicle into space and the deceleration accompanying its return to the atmosphere subjects a man to g-loads several times the normal gravity.

Both conditions were subject to intensive research.[4, 5] However, weightlessness is difficult to experience on earth. An airplane following a particular parabolic flight path can produce weightlessness for example, but only for about half a minute. Heavy acceleration can be trained in centrifuges or in rocket sled tests. John Stapp was subjected to 15 g for 0.6 second and a peak of 22 g during a rocket sled test on 19th March 1954.

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Special drug equipment

In order to cope with the unique requirements of space, specific drugs and appropriate dosage forms have been developed.[6] Although the Mercury flights were relatively short – ranging from 15 minutes to 36 hours – the physicians provided a medical kit focused on the most important and expected health issues. This included a number of medications for inflight use as well as a survival pack - meant for a landing at an unexpected site. The medical kit contained morphine for pain, mephentermine sulfate for shock, benzylamine hydrochloride for motion sickness, and racemic amphetamine sulfate for a stimulant. Bandages and a drug for diarrhoea were also issued.

To facilitate the injection of drugs, so-called Astropens were developed and first stitched into the spacesuits of the astronauts.[7] In case they needed the medication they were able to induce the injection. These pens looked like harbingers of the insulin pens we know today.

For the NASA, the Mercury and Gemini programs had raised some concerns about the health and safety of future crews. For example, the high metabolic energy expenditure of extravehicular activity during the Gemini missions was unexpected. Physiological changes were noted in individual crewmen, some more consistently than others. The most important of these changes was in cardiopulmonary status shown by decreased exercise capacity, loss of red blood cell mass, and cardiovascular deconditioning demonstrated by a decrease in the effectiveness of antigravity cardiovascular responses during postflight stress testing.

At the end of the Gemini program, with 2000 man-hours logged in space, it was clear that man could engage in relatively long space flight without any serious threat to health. However, clarification was still required in many areas.

Landing a man on the moon

President John Fitzgerald Kennedy (1917-1963) announced NASA's third human spaceflight program, Apollo, on May 25, 1961:

> I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth.

Among the risks for a successful mission were medical concerns. Therefore, NASA selected and carefully monitored the astronauts as well as the drugs they took with them.[8]

A very strict selection process of appropriate drugs generated the medical accessory kit on board the spacecrafts. In 1967, an internal report addressed the selection of drugs to be in the medical kit. James Wittmer proposed a list of 36 conditions to be addressed.[9] However, due to weight and volume limitation, NASA at first took fewer drugs than recommended.

So, when the United States set sail to go to the moon, and Apollo 8 was the first manned spacecraft that left earth orbit for a longer period and with no chance of intervention, the medical kit needed to be properly packed. Regarding the mission itself, Apollo 8 was the first to cycle around the moon and some readers might probably remember the crew sending a special message on Christmas Eve 1968 in which they read the first 10 verses from the Book of Genesis.

Although the basic contents of the medical kits of the Apollo Command Module remained the same for each mission, there was no 'standard' kit.[10] For Apollo 11, the NASA press information stated:

> Pills in the medical kit are 60 antibiotic, 12 nausea, 12 stimulant, 18 pain killer, 60 decongestant, 24 diarrhea, 72 aspirin and 21 sleeping[11] (see Table 1).

However, the adequacy of the kits was reviewed after each flight, and appropriate modifications were made for further missions. For example, the combination scopolamine/dextroamphetamine sulfate was substituted after Apollo 11 for the previously stowed oral cyclizine hydrochloride after ground-based tests indicated it was more effective for the treatment of motion sickness.

NASA selected a lot of drugs with empirical knowledge at that time in order to minimise the risk of unknown drug reactions. That is why during the preflight training, drug sensitivity testings were performed to determine the response of all flight crewmembers to each item in the medical kit to preclude allergic reactions and other undesirable side-effects. But interestingly, NASA relied not only on drugs with a longer history or experience in use such as barbiturates or amphetamines, but also added a few new active substances like oxymetazoline, but not benzodiazepines.[12]

Each Apollo vehicle carried the medical accessory kit in a compartment behind the Lunar Module Pilot's couch. An additional abbreviated version of the Command Module medical kit was carried in the Lunar Module.[13] Pills and tablets in the medical kits were packaged in such a manner that the crewman had easy access to the medication at all times. The pills were sealed individually. Midway through the Apollo Program, the number of pills in the kit was increased. The use of standard spray bottles in a weightless,

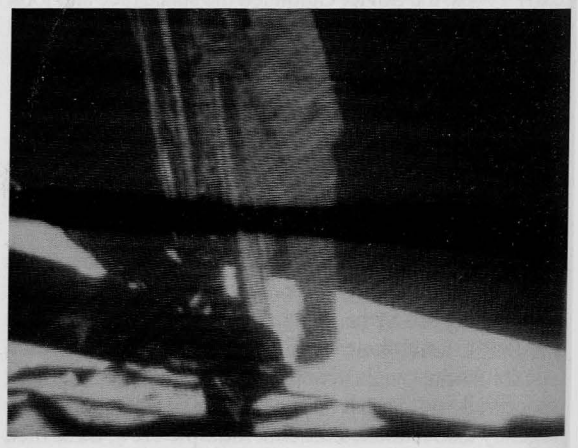

Figure 1: "That's one small step for man; one giant leap for mankind" (Photo: NASA[18])

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Table 1: Apollo Medical kit contents, Source: NASA[14]

Command Module Medical Kit			Stowed/Used										
Drug	**Dosage and Form**	**use**	**Apollo 7**	**Apollo 8**	**Apollo 9**	**Apollo 10**	**Apollo 11**	**Apollo 12**	**Apollo 13**	**Apollo 14**	**Apollo 15**	**Apollo 16**	**Apollo 17**
Methylcellulose	solution 0.25%	eye drops	2/1	2/2	2/0	2/0	2/0	2/0	2/0	2/0	1/0	2/1	1/0
Meperidine HCl (pethidine, Demerol)	90 mg (0.9 cc in injector)	pain	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/?	3/?
Cyclizine HCl (Marezine)	45 mg (0.9 cc in injector)	motion sickness	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/?	3/?
Cyclizine HCl (Marezine)	tablets 50 mg	motion sickness	23/3	24/1	24/4	12/0	-	-	-	-	-	-	-
Dexamphetamine SO4 (Dexedrine)	tablets 5 mg	stimulant	12/1	12/0	12/0	12/0	12/0	12/0	12/1	12/0	12/0	12/0	12/0
Dextropropoxyphene HCl (Darvon)	cpd capsules 60 mg	pain	12/2	18/0	18/0	18/0	18/0	18/0	18/0	18/0	18/0	18/0	18/0
Triprolidine/Pseudoephedrine (Actifed)	tablets 60 mg	antihistamine	24/24	60/0	60/12	60/2	60/0	60/18	60/0	60/0	60/0	60/0	60/1
Diphenoxylate HCl + Atropine SO4 (Lomotil)	tablets 2.5 mg + 0.25 mg	diarrhea	24/8	24/3	24/1	24/13	24/2	24/0	24/1	24/0	24/0	24/0	48/5
Nasal emollient		nasal	1/0	2/1	2/1	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0
Acetylsalicylic acid (Aspirin)	tablets	NSAID	72/48	72/8	72/2	72/16	72/Unk	72/6	72/30	72/0	72/0	72/0	72/0
Tetracycline HCl	tablets 250 mg	antibiotic	24/0	24/0	24/0	15/0	-	-	-	-	60/0	60/0	60/0
Ampicillin sodium	tablets 250 mg	antibiotic	-	60/0	60/0	45/0	60/0	60/0	60/0	60/0	60/0	60/0	60/0
Secobarbital sodium (Seconal)	capsules 100 mg	sleeping	-	21/1	21/10	21/0	21/0	21/6	21/0	-	21/0	21/3	21/16
Secobarbital sodium (Seconal)	capsules 50 mg	sleeping	-	12/7	-	-	-	-	-	-	-	-	-
Oxymetazoline HCl (Afrin)	nose drops	vasoconstrictor	-	3/0	3/1	3/0	3/0	3/1	3/1	3/1	3/0	3/0	3/3
Diphenhydramine HCl (Benadryl)	capsules 50 mg	antihistamine	-	8/0	-	-	-	-	-	-	-	-	-
Acetaminophen (Tylenol)	tablets 325 mg	NSAID	-	14/7	-	-	-	-	-	-	-	-	-
Compression bandage			2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0
adhesive bandage (Bandaids)			12/2	12/0	12/0	12/0	12/0	12/0	12/0	12/0	12/0	12/0	12/0
Antibiotic ointment	bottle	skin	1/1	1/0	1/0	1/0	1/0	2/0	2/0	2/0	2/0	2/1	2/1
Skin cream	bottle	skin	1/0	1/1	1/1	1/0	1/0	1/0	1/0	1/0	1/0	1/1	1/0
Bacitracin	eye ointment	antibiotic	-	-	1/0	-	-	-	-	-	-	-	-
Scopolamine + Dexamphetamine sulfate (Dexedrine)	0.3 mg + 5 mg capsules	motion sickness + stimulant	-	-	-	-	12/6	12/0	12/2	12/0	12/0	12/0	12/1
Tetrahydrozoline HCl (Visine)	eye drops	vasoconstrictor	-	-	-	-	-	-	-	-	-	-	1/1
Simethicone (Mylicon)	tablets	antiflatulents	-	-	-	-	40/0	40/0	40/0	40/0	40/0	40/0	40/0
Proparacaine HCL (Opthaine)		local anesthetic	-	-	-	-	-	-	1/0	1/0	1/0	1/0	1/0
Multi-Vitamin			-	-	-	-	-	-	-	20/0	-	-	-
Procainamide HCL (Pronestyl)		antiarrhythmic	-	-	-	-	-	-	-	-	-	80/0	80/0
Lidocaine		local anesthetic	-	-	-	-	-	-	-	-	-	12/0	12/0
Atropine	anticholinergic/ muscarinic antagonist		-	-	-	-	-	-	-	-	-	12/0	12/0
Meperidine HCl (Demerol)		pain	-	-	-	-	-	-	-	-	-	6/0	6/0

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reduced-pressure environment proved unsatisfactory. Sprays were therefore replaced by dropper bottles.

The medical kits onboard of the Apollo modules were used several times during the missions. The internet pages of NASA give a detailed list of all drugs used during the missions.[14] Among the most frequent drugs taken were aspirin, secobarbital sodium (Seconal, quinalbarbitone sodium). During Apollo 7, 9 and 17 several tablets against

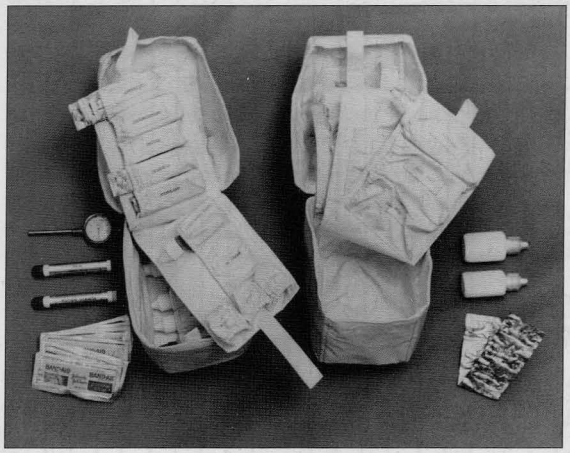

Figure 2: Medical Kit for the the first lunar orbit mission, Apollo 8. (Photo: NASA)

diarrhoea found a user. But until today, motion sickness is the most important problem.

As the same conditions need to be addressed, the Russian version of mankind's most remote pharmacy, the medical kit carried in the Soyuz capsules, contained similar drugs.[15] The medical kit of the space shuttle has been much larger. Due to the longer durations of the flights the medical needs are simply more. Today, the medical features of the International Space Station (ISS) include a wider variety of drugs allowing the crews to treat major and minor health complaints. The ISS holds several medical kits in different compartments and they are organised by complaints or symptom groups[16].

Modern research of space medicine on earth is mostly based on the Anti-Orthostatic Bed Rest model (ABR). The subjects are made to rest in a 6° to 12° head-down tilt for an extended time. This causes body fluids to redistribute from the lower extremities toward the upper torso and neck regions, similar to what happens during space flight. Volunteers stay about 72 hours in this position – or much longer, weeks or months – while blood tests on pharmacokinetics and pharmacodynamics are performed[17].

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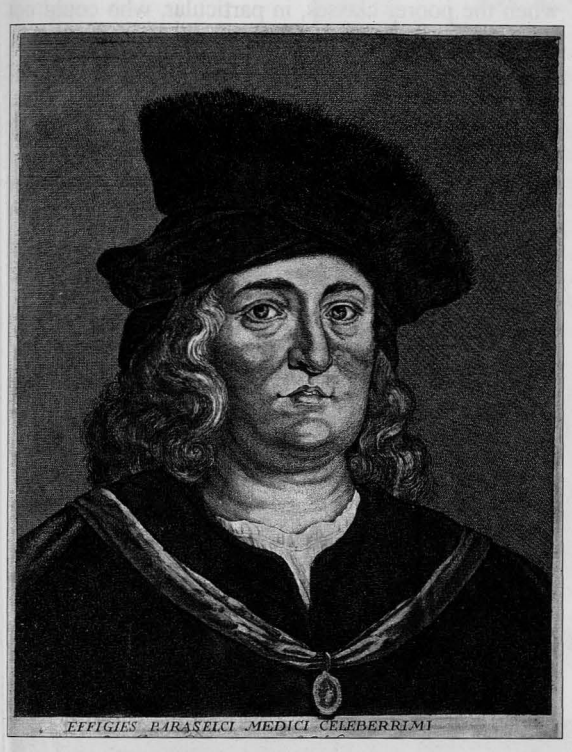
An early *Poudre des Chartreux* described by Paracelsus

Patrizia Catellani and Renzo Console



Portrait of Paracelsus. Wellcome Library, London.

Our readers may remember an article in two parts written by ourselves on the *Poudre des Chartreux* or Mineral Kermes, and recently published in the *Pharmaceutical Historian*.[1]

The earliest references to such preparations that we had been able to mention in our article were those found in the *Currus Triumphalis Antimonii* published in 1604 under the name of Basilius Valentinus, a mythical Benedictine monk of the 15th century.[2]

After completing our research for our article we regretted not having been able to find any preparations of sulphurous compounds of antimony similar to the future *Poudre des Chartreux* in the works of the famous alchemist, physician, botanist, astrologer and occultist Theophrastus Bombastus von Hohenheim (1493-1541), usually known as Paracelsus. If we had, they would have preceded those of 'Basilius Valentinus' by approximately 60 years or more, and would be very important in the context of our subject.

So we decided to consult as many as possible of Paracelsus's chemical works and have found a preparation that meets our requirements. It is in a collection of Paracelsus's medicinal formulae published posthumously in 1578, collected and translated into Latin by the scholar Gerhard Dorn, entitled *De Restituta Utriusque Medicinae Vera Praxi*. There is a section called *Antimonij pulvis rubeus* ('Red powder of antimony') containing an accurate description of a medicine having this name, which, in our opinion, looks extraordinarily similar to the future *Poudre des Chartreux* and even to the subsequent Mineral Kermes.

This preparation does not coincide exactly with any of those that can be seen in our article; but the method used is generally like many future ones, i.e. first to prepare a strong chemical solvent (in this case a salt of tartar) and then to apply it to antimony ore with water; and eventually to use vinegar repeatedly to eliminate antimony's sourness and toxicity. And the product, when dry, is a red powder like in the cases of all other more recent similar substances.

This is our best attempt to translate this preparation accurately[3]:

> First make a salt with tartar calcined until it is white, dissolved in lukewarm water. After the perturbation they should rest, and the water will be separated by inclination into another vessel, and more water infused into the previous similar one, and separated as many times, until no sourness can be perceived in the tartar, and it can separate sweet from the earth. Disperse all collected waters in the air by distillation, so that the salt of tartar remains at the bottom.
>
> Take three ounces of this salt; dissolve it in half a pound of water; add half an ounce of triturated antimony; cook them together for a while; let the water be very clear, which later cools down, becomes red, and hardens. Soon afterwards pour a little of distilled vinegar in, and the sourness of the salt, and the toxicity of antimony, fall to the bottom. Pour that liquid, and pour in plain and lukewarm distilled water several times until no sour taste can be perceived. Finally it should be dried as a very red powder. Its dose is one and a half grains.

We would appreciate it if some sympathetic readers could compare this preparation with others in the two parts of our original article in order to judge whether our opinion on the similarity of this formula to some of the others is correct. We would also like to ask our readers whether they are aware of similar preparations that might have been described even before Paracelsus's time.

Authors' Addresses: Patrizia Catellani, *patcat@interview.it*;
Renzo Console, *mail@renzoconsole.demon.co.uk*.

End Notes and References

1. *Pharmaceutical Historian*, 2009; 39 (3): 42-48; and 39 (4): 50-59.

2. But later most historians concluded that Basilius Valentinus was just a pseudonym adopted by Johann Thölde, the editor of that book. So our earliest predecessors of the Poudre des Chartreux were very likely to have been created at the beginning of the 17th century.

3. Paracelsus. *De Restituta Utriusque Medicinae Vera Praxi*. Lyons: Iacobus du Puys, 1578: 10.

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The Fall and Rise of Perceptions of Community Pharmacy

Trevor Whaley
Doncaster

During the 2008-09 University year the Society's Museum surveyed all schools of pharmacy to determine the type of resources they would wish to see to support history teaching in the future. One option was an exhibition panel, and the University of Huddersfield, which had in 2008 admitted students to the first year of its new MPharm course, responded to say that they would be interested in having one.

Deputy Head of Pharmacy, Margaret Culshaw, suggested to her students that rather than simply accepting a prepared panel they might wish to consider the idea of researching and preparing their own, as an extra-curricular history-based project. The result was that during the summer vacation three students, Mohammad Kolia, Jessica Campbell and Abbas Samnani (from left to right in the photograph) spent a day in the Museum at Lambeth collecting all of the information required. They then commenced work on preparing the written content and, with the help of the University designers, and financial support from BSHP, produced their banner display entitled *The Fall and Rise of Perceptions of Community Pharmacy.* The unit is designed to retract completely into its base, together with its supports, and can be easily carried by one person to any required site.

The banner follows the public's perception of Pharmacy from the later years of the 19th century when the poorer classes, in particular, who could not afford expensive doctors' fees, saw the pharmacist, with his mysterious creams and ointments, as a rather 'magical being' who could cure any of their ailments, through to the introduction of the NHS when rising prescription volumes saw pharmacists retreating more into their dispensaries. It concludes, on a far brighter note, with details of the current enhanced role, expert advice and numerous services that make today's pharmacist such an important healthcare professional.

Alongside this is a time-scale which includes the major milestones that have affected the practice of the profession. It starts at the Apothecaries Act of 1815, through 1841 and the formation of the Society, the various Acts of Parliament and Supplemental Charters and leading finally to 2010 and the formation of the new Professional Body.

BSHP would like to thank and congratulate everyone involved in Huddersfield, with the hope that this newly established link can be maintained and expanded to mutual benefit.

For detail of the panel see the inside back cover.

MPharm students at Huddersfield University (from left to right), Mohammad Kolia, Jessica Campbell and Abbas Samnani, with Trevor Whaley and Ann Hutton, representing the British Society for the History of Pharmacy.

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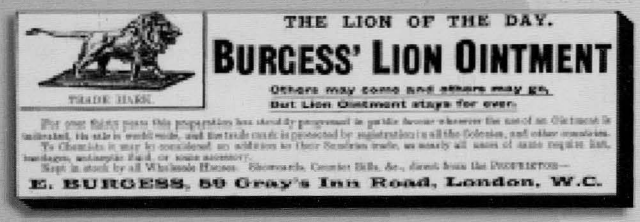
The Fall and Rise of Perceptions of Community Pharmacy

PRESTIGE

In the late 1800s pharmacists were viewed as 'magical beings' who could cure any illness with their mysterious creams and ointments. Pharmacists gave healthcare advice to the poorer people who couldn't afford doctors' fees. Through the Pharmaceutical Society, Pharmacy was established as a profession.

From the early 1900s, laws were put into place to prevent pharmacists from marketing drugs and claiming that they treated any illness. The development of the NHS confirmed the pharmacist's role as dispensing doctors' prescriptions and the image of pharmacy changed as the volume of prescriptions caused the pharmacist to retreat to the dispensary.



As the public gained more knowledge and pharmacists became less visible to patients, they were no longer viewed as important healthcare professionals and lost their magical status.

Pharmacists nowadays are enhancing their role as healthcare professionals. As the expert on medicines they can offer a wide range of services to the public, including stop smoking campaigns and medicine use reviews.

As the first and accessible point of contact, pharmacists can offer excellent advice on ailments and healthy lifestyles and are ideally located to signpost patients to other healthcare professionals.

The image of pharmacists has changed throughout the eras, but the profession has adapted. Pharmacists are now extremely important healthcare professionals.

Moving into the future with confidence

1815 Apothecaries Act

1841 Pharmaceutical Society established

1852 Pharmacy Act

1853 Supplemental Charter for Pharmacy

1908 Poisons & Pharmacy Act

1911 National Insurance Act

1925 Therapeutic Substances Act

1933 Pharmacy & Poisons Act

1938 Food & Drugs Act

1941 Pharmacy & Medicines Act

1946 NHS Act

1953 Supplemental Charter

1968 Medicines Act

1987 Pharmacists Fitness to Practise

1999 Health Act

2000 Health Act

2006 Health Act

2010 New Professional Body for Pharmacy

YEARS

University of HUDDERSFIELD

Project undertaken by MPharm students J.Campbell, M.Kolia and A.Samnani

The history of pharmacy panel produced by pharmacy students at Huddersfield University (see p. 20).

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Professional Leadership Body for Pharmacy: Outline of possible affiliative relationships with other bodies

Following discussion with the Royal Pharmaceutical Society, BSHP has received the following response:
The new Professional Leadership Body (PLB) will be built on the RPSGB, and until decided otherwise will be called the Royal Pharmaceutical Society. In moving to this new status, it will be important that the PLB retains the relationships that the Society currently enjoys with selected other bodies, but in the context of an organisation that has to operate on commercial lines in order to ensure its financial viability, recognising its dependence on voluntary membership.

The TransCom prospectus for the PLB suggested an affiliation between the PLB and the Association of Pharmacy Technicians UK. In developing the internal and external relationships of the PLB, consideration has since been given to the possibility of affiliative relationships with other bodies, whose own members may not all be eligible for membership of the PLB.

Affiliated organisations would retain full autonomy for their own affairs, but have an "organisation to organisation" relationship with the PLB (as opposed to a relationship through their individual members).

This relationship would enable the affiliated organisation to have:

- Access to library facilities at our Lambeth office for their members
- Access to meeting rooms and catering facilities at advantageous discounted rates. These rates would be the same for all affiliated organisations, and would typically represent a discount of 30% to 50% depending on the facilities requested and availability
- Signposting to their activities on the PLB website, subject to agreement on the nature and frequency of that signposting
- Negotiated provision of other services from one party to the other.

In return, the affiliated organisation would provide input, at the PLB's request, on issues that both parties agree are of relevance to the affiliated group's own remit and expertise. This could include (but would not be limited to) contribution to the contents of the PLB website and events.

An affiliation with the PLB would typically be confirmed in a Memorandum of Understanding, with a clause relating to notice of termination by either party.

In addition to affiliative relationships with selected organisations, the PLB team is also developing close working partnerships with organisations which are involved with the professional agenda of the PLB and which expect a majority of their members to be members of the PLB. This is aimed at ensuring the most effective coordination of professional leadership activity across all the areas where pharmacists practise or are keen to see influence. 27 January 2010

Museum Oral History Collection

The Museum's oral history collection is now available in the RPSGB Library. As a result of a 4-year programme to transfer original reel-to-reel tape and cassette to CD format, more than 100 interviews can be listened to by making an appointment with the Museum.

You can search what is available via the Library's online catalogue *http://olib.rpsgb.org/* If you put the word 'interview' into the free text search, you will bring up a full listing of all the available recordings. For further information, contact the Museum on 020 7572 2210 or *museum@rpsgb.org*

Interviewees over the last 50 to 60 years have included many names involved in the Society or the pharmaceutical sciences, such as Prof. Arnold Beckett, James C Bloomfield, Robert Blyth, Charles Drummond, JW Fairbairn, Herbert S Grainger, Douglas C Harrod, Sir Frank Hartley, Doris M Jones, Desmond F Lewis, Lesley G Matthews, Pamela M North, FNL Poynter, JM Rowson, and TE Wallis. Many of the interviewers are themselves no less interesting.

Evening meetings online

If you are unable to attend evening meetings at Lambeth, there is now a way to listen to the talks that you missed. Starting with Anna Parkinson's talk *Nature's Alchemist: John Parkinson* given on 4 November 2009, sound recordings of BSHP and Museum lectures are available on the Museum's Events webpage *www.rpsgb.org/informationresources/museum/museumevents/*

STOP PRESS: Briony Hudson's illustrated Delftware lecture on 17 February 2010 is now available on:
https://rpsgb.webex.com/rpsgb/lsr.php?AT=pb&SP=EC&rID=7444382&rKey=A24A84044E1D9091

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PHARMACEUTICAL HISTORIAN

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British Society for the History of Pharmacy
840 Melton Road, Thurmaston, LEICESTER LE4 8BN

Founded 1967

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British Society for the History of Pharmacy

840 Melton Road, Thurmaston, Leicester, LE4 8BN
Tel: 0116 264 0083, Fax: 0116 264 0141, Email: bshp@associactionenterprises.com

The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.
BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist.

Aims

Promotion of historical studies related to pharmacy.
Advancement of knowledge and propagation of understanding of the history of pharmacy.
Publication of the research work of pharmaceutical historians.
Preservation of pharmaceutical artefacts and historic pharmacies.
Support for the work of relevant museums and offering advice on establishment of other pharma-ceutical exhibits and on the preservation of pharmacies.
Co-operation with related professions and local historians on medico-pharmaceutical topics of mutual interest.

Pharmaceutical Historian

The *Pharmaceutical Historian* has been published since 1967, at first intermittently, but on a regular quarterly basis from 1972. Issues generally comprise 16 pages and cover.
An index for the years 1967-1995 was published in 1998. An index for 1996-2000 was published in 2000 and for 2001-2005 in December 2005.
Papers, short communications and letters in English on any aspect of the history of pharmacy are welcome and should be sent to the address above or by email to *bshpeditor@associationhq.org.uk*
Any illustrations are converted to monochrome for printing. Further details of requirements can be found on the website *www.bshp.org* under Publications.

Membership

Membership costs £20.00 per annum and includes:

Four issues of the *Pharmaceutical Historian*.

Regular meetings, with guest speakers, usually in November, February and May.

Visits to places of historic interest, museums, collections, botanical gardens, etc.

Annual Conference, usually in March/April.

Free use of Royal Pharmaceutical Society of Great Britain's library facilities for research.

Help in historical research and with the identification of artefacts.

Affiliation to the International Society for the History of Pharmacy (ISHP).

Affiliation to the British Society for the History of Medicine (BSHM).

Application forms are available from the Honorary

Presidents of the British Society for the History of Pharmacy

1967	Mr James C Bloomfield
1968, 1969	Mr Leslie Matthews
1970, 1971, 1972	Dr Melvin Earles
1973	Dr T Douglas Whittet
1974, 1975	Dr John K Crellin
1976, 1977	Dr Juanita Burnby
1978, 1979	Miss D Ann Hutton
1980, 1981	Mr Albert Wright
1982, 1983	Dr William E Court
1984, 1985	Mr A G Mervyn Madge
1986, 1987, 1988	Mr John E Steane
1989, 1990	Dr Melvin Earles
1991, 1992	Mr William A Jackson
1993, 1994	Dr David B Jack
1995, 1996	Mr Anthony C Morson
1997, 1998	Dr John A Hunt
1999	Mrs Enid Lucas-Smith
2000, 2001	Dr Peter M Worling
2002, 2003, 2004	Dr Stuart Anderson
2005, 2006	Dr Shirley Ellis
2007, 2008	Dr Michael H Jepson
2009, 2010	Mr Roger C Mills

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PHARMACEUTICAL HISTORIAN

Editor: Ainley Wade, BPharm, MPhil, FRPharmS, FSP
840 Melton Road, Thurmaston, LEICESTER LE4 8BN

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Diary

Note earlier starting time for meetings

Wednesday 30 June 2010

Visit to the Garden of the Royal College of Physicians

Wednesday 29 September 2010

'The Making of "The Victorian Pharmacy"' by Professor Nick Barber, School of Pharmacy. 6.00 at Lambeth.

Wednesday 17 November 2010

'Horatio Nelson: his wounds' by Peter Warwick, President of the 1805 Society, 6.00 at Lambeth.

BSHP Officers

The Committee has elected the following Officers: President and Treasurer Mr Roger Mills; Secretary Mr Peter Homan; Vice President Mr Trevor Whaley.

Interested in helping out at the RPSGB Museum?

There are opportunities available for additional volunteers to get involved at the Museum of the Royal Pharmaceutical Society. Potential tasks include helping with publicity and mailings, working alongside the staff to sort out our existing rare books and archive holdings, and working with our *materia medica* collections to improve their storage. We would also be keen to hear from anyone who is interested in being trained to lead guided tours of our displays. The commitment needed will depend on the task, but we are able to be flexible: some projects would be ongoing, others quarterly and others could be worked on with a day a fortnight. The most important qualifications are ease of transport to Lambeth High Street, a willingness to help out, and a sense of humour! Contact Briony Hudson on 020 7572 2211 or *briony.hudson@rpsgb.org* (Wednesdays and Thursdays only) if you would like to find out more.

The Leslie Matthews Medal

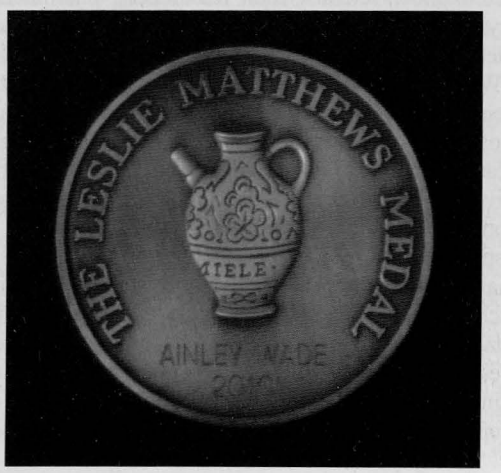
'The Leslie Matthews Medal is awarded for original and scholarly work in the field of the history of British pharmacy. It has been awarded in the past to Leslie Matthews, Juanita Burnby, Melvin Earles and William Jackson. The award has now been made to Ainley Wade.

Ainley was involved in the founding of the British Society for the History of Pharmacy in 1967 as an employee of the PSGB and has been continually involved with the Society since. His research topics have covered the history of *Martindale*, of which he was editor for six years, and, more recently, the spa waters of Bath.

However, it is as the Editor of the *Pharmaceutical Historian* that his most distinguished contribution to the history of British pharmacy is shown. He took over the editorship in 2000 and has since transformed the journal into one of the leading journals for the history of pharmacy in the English language. It is not just the careful selection of papers which has contributed to this, but also the detail and support which he gives in his editing to the authors of the papers which are submitted. This is appreciated by all those writing for the *Historian*, particularly where English is not their native language.

It was with very great pleasure that I awarded the Leslie Matthews Medal on your behalf to Ainley Wade.'

Roger Mills
President BSHP, Llanelli 2010



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Lapis de Goa : the 'Cordial Stone'

Dr Christopher J. Duffin
Sutton, Surrey

The Lapis de Goa or 'Goa Stone' was a confection of musk, oriental bezoar, ambergris, red and white coral, emerald, topaz, ruby, sapphire, jacinth, small pearls, fossil shark's teeth, terra sigillata, stones from Cananor and calcined deer horn. Invented by the Jesuit, Gaspar António, working in Goa during the late 17th century, the recipe was a closely guarded secret but later copies involved adulteration with additional ingredients. The artificial stone appeared at a time when bezoar stones were difficult to come by, was used both locally and formed part of a thriving export industry to Europe, where it was a popular alexipharmic and cordial (invigorating medicine) well into the late 18th century.

Introduction

Goa is located roughly one third of the way up the west coast of India, and is that country's smallest state. Portuguese influence in the area began with the arrival of the famous explorer, Vasco da Gama (1460 or 1469-1524), in the summer of 1498. A further two visits (1503 and 1524) were instrumental in establishing trading posts, suppressing Arab opposition to their presence, securing trading rights and annexing the area to the Portuguese empire. Following the establishment of successful trade routes, waves of Christian missionaries entered Goa; Dominican monks who arrived around 1510 were followed by Franciscans in 1517, who were themselves succeeded by the Jesuits in 1542. This latter group was a newly formed Catholic religious order. The Society of Jesus ('Companhia de Jesus') was founded in Paris in 1534 by St Ignatius Loyola (1491-1556) and six colleagues. One of these founding members, St Francis Xavier (1506-1552), used Goa as a base from which to complete a number of missionary journeys further east to Macau, Japan and China.[1] From this point on until their eventual expulsion from the area in 1749, the Jesuits became increasingly influential in Goa, reinforcing their Christian message with major contributions to local communities, counting among their number scientists and researchers, pharmacists, physicians, sculptors, painters, carpenters and bricklayers. They also began to dominate trade.

With the treatment of the sick being an integral part of their Christian duties, Jesuit scientists, physicians and apothecaries investigated the properties and effectiveness of indigenous medicinal plants, partly driven by their receipt of rather limited medical support from their home countries.[2] Often beginning as dispensaries of only local importance, many Jesuit pharmacies became international centres of scientific exchange and medical supply, leading to the establishment of a global network of drug transfer.[3] Western m*ateria medica* and *pharmacopoeias* became significantly influenced by new ethnopharmaceutical preparations, including items such as 'Jesuit Bark' (*Cinchona*) against malaria, Passionflower, Ipecacuanha (*Psychotria*) and Jaborandi (*Pilocarpus*). Significant amongst the contributions from the Goa fraternity was the Lapis de Goa, or 'Goa Stone', whose origin and composition were shrouded in mystery.

Lapis de Goa

1. Origin and production

The Lapis de Goa was the brainchild of Gaspar António. Very little is known about this Jesuit lay brother except that he was a Florentine.[4] Dr John Freyer, a physician with the East India Company, visited Goa in 1675, and writes :

> The Paulistines enjoy the biggest of all the Monasteries at St. Roch; in it is a Library, an Hospital, and an Apothecary's Shop well furnished with Medicines, where Gasper Antonio, a Florentine, a Lay-Brother of the Order, the Author of the Goa stones, brings them in 50000 Xerephins, by that invention Annually; he is an Old Man and almost Blind, being of great Esteem for his long practice and therefore applied to by the most Eminent of all Ranks and Orders in this City; it is built like a Cross, and shews like a Seraglio on the water.[5]

This information would place the invention of the Lapis de Goa around the mid-17th century.[6] The stimulus for the development of this artificial stone seems to be closely related to the contemporary situation regarding bezoar stones.

Bezoars are undigested concretionary masses of organic or inorganic material which get trapped in the gastro-intestinal tract, especially the stomach. The earliest written accounts of bezoar stones come from the Persian and Arabic medical traditions, probably as early as the ninth century. Abu Mansur Muwaffak, a tenth century Persian physician, classified the bezoar as a precious stone, for example, in his *Book of the Remedies* (*Kitab al-abnyia 'an Haqa'iq al-adwiya*), a materia medica dealing with 585 remedies compiled between 968 and 977 AD. Slightly later on, Abū Rayhān al-Bīrūnī (973-1048), from what is now Uzbekistan, wrote his Book of Precious Stones (*Kitab al-Jawahir*), referring to bezoars as 'costliest amongst stones' because, rather than just being an object of personal adornment, it 'guards the body and the soul and saves them from being harmed'.[7] With reference to earlier and contemporary accounts, Al-Biruni goes on to describe a number of varieties of the stone, including one which he says is referred to as 'the snot of Satan and the Warlock's Thread'.[8] With reference to specific case histories, he extols their medical efficacy in counteracting the effects of poison.

Medicinal use of bezoars in Europe seems to have begun in the twelfth century,[9] but became increasingly popular through the fifteenth and sixteenth centuries, and finally waning in the latter stages of the seventeenth century. The stones were collected from a range of animals including monkeys, hedgehogs, horse and oxen, and even antelope and rhinoceros.[10] Fossil bezoars were cited in 1742 by Geoffroy, recalling references to coprolites as bezoar stones from the cliffs of Lyme Regis.[11] The main source of the stone,

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however, was the Bezoar Goat, *Capra aegagrus aegagrus* Erxleben, 1777, the wild progenitor of the domestic goat, widespread through Asia Minor and the Middle East (Fig. 1). Jean-Baptiste Tavernier (1605-1689), the famous French traveller and trading pioneer, described how Golkondan peasants from south-central India palpate the belly of the goat in order to determine the number and sizes of any bezoars present in the digestive tract.[12]

Figure 1. The Oriental Bezoar Goat, *Capra aegagrus aegagrus* Erxleben, 1777, and its stone (from Valentini 1714, Museum Museorum).

Pulverised scrapings from the bezoars were added to various media in order to make a healing cordial or draught which was then used as a sudorific (to promote sweating), alexipharmic (antidote against poisons), lithontriptic (to break down various renal calculi) and cardiac tonic. They were held in high esteem by physicians and apothecaries; royal and other important patients often kept them in specially designed gold or silver boxes which were occasionally ornamented with jewels.[13] Queen Elizabeth I (1533-1603) wore a specimen set in a ring on her finger, and an otherwise unidentified one of the number of the King Edwards of England was supposedly cured by the use of the stone.[14]

The strong reputation, popularity and consequent high monetary value of bezoars led to a brisk European trade with the Middle East and India. Caspar Bauhin (1560-1624) remarks that:

> Even today princes and nobles prize it very highly and guard it in their treasures among their most precious gems; so that the physicians are forced, sometimes against their better judgment, to employ it as a remedy. So great are its virtues that many imitations are made.[15]

The fabrications began to creep into the market despite a long established tradition of tests to identify authentic stones.[16] Cristóvão da Costa (also referred to as Cristóbal de Acosta; 1515-1594), the Portuguese physician and natural historian, came across the trade in imitation bezoars whilst serving as personal physician to the Viceroy of Goa around 1568. Cleverly faked bezoars were produced by combining finely ground clay, oyster shells, lime, much as in the local building material called *chunambo*, with the added ingredient of small (and therefore cheaper, more inferior) bezoar stones to add a touch of authenticity and satisfy a sense of moral probity.[17] By the late seventeenth century, Pierre Pomet (1658-1699) was bewailing the fact that

> there is a great deal of Trouble in meeting with the natural Stone as that certain Persons have found out the Secret of Counterfeiting it by Reason these Animals do not provide any considerable Quantities; and besides several of 'em have none at all.[18]

The establishment of Jesuit pharmacies employing specialist Portuguese brothers in Goa permitted close examination and exploitation of indigenous ethno-pharmaceutical preparations and led to the development of numerous new simples. The export market to Lisbon was assured. By keeping the recipes to their various preparations secret, the Jesuits ensured that they were able to monopolise production and trade in these valuable commodities. Only those appropriately certificated preparations could be identified as authentic. The newly developed Lapis de Goa was especially successful in this regard. By utilising locally obtained bezoars and combining them with a range of additional ingredients, an item was produced which could combine replication of the beneficial effects of the bezoar stone, enhanced by the additives, and backed with a system of authentication. As a result, the Colégio de São Paulo in Goa was able to export many *arrobas* (an archaic measure of weight equivalent to around 32 pounds [14.5 kg]) to Lisbon and thence to the pharmaceutical markets of Europe, as well as to other cities (such as Macau in south east China) which were home to Jesuit Colleges.

On the death of its inventor, Gaspar António, the recipe for producing the Lapis de Goa passed to the priest, Father Jorge Ungarate and his team. The Jesuits were expelled from Goa in 1759, at which point the information was given to the Capuchin friars of the Convento da Madre de Deus in Goa, who continued to produce the stone until the closure of the convent in 1835.[19] At this point, the secret was passed to the provincial Friar Manuel do Carmo Pacheco, who continued to produce the stone at the Convento do São Francisco of Goa until his death in 1868. By then the only strong market for the stone was Macau.

2. Specimens

Ana Maria Amaro describes surviving specimens of Lapis de Goa as being in the forms of a quadrangular prism or cylindrical stick.[20] Covered with gold or silver leaf and given a surface polish, powdered fragments of the stones apparently had an insipid, clay-like to slightly sweet taste. The specimens which I have seen in early eighteenth century British medical cabinets have been either spherical or hemispherical in shape, measuring up to about 5cm in diameter[21] (Fig. 2). In larger collections, the Goa Stone is often accompanied by a holder and stand (Fig. 3). The Burghley House Collection (Stamford, Lincolnshire), for example, contains a late

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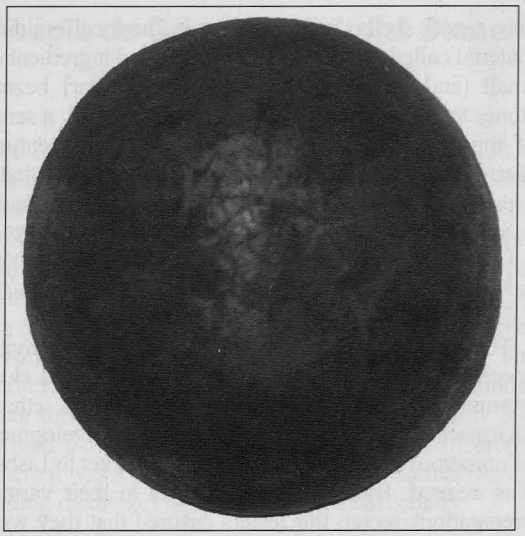

Figure 2. Goa Stone from Drawer 17 of the Heberden Materia Medica cabinet, St John's College, Oxford.

seventeenth century, round, silver gilt container made of a finely fretted and engraved cagework of dense leafy scrolls seated on a three-legged stand.[22] Similar specimens are present in the Victoria and Albert Museum (Inv. Nos. 781, 782-1891), the Wellcome Collections, the Metropolitan Museum of Art (New York) and the Hull Grundy Collection of the British Museum. Horace Walpole (1717-1797) was given a specimen and a further example was used for medicinal purposes by the Heathcote family.[23]

3. The original recipe

Three undated manuscript versions of the original recipe for the Lapis de Goa are located in the archives of the Society of Jesus in Rome and are reproduced by Ana Maria Amaro.[24] Table 1 (p. 25) summarises the content of these recipes in comparison to later published versions. It is interesting to note that, even amongst these three manuscript versions, there is some variation. All three agree that seed pearls, musk, ambergris, oriental bezoar and the tips of deer horn should be added

Figure 3. Goa stone in a gold filigree holder with stand (Wellcome Collection, Science Museum, A642470, image number L0058635)

to precious stones (emerald, topaz, ruby, jacinth and sapphire) and medicinal earths (Terra sigillata). The most extensive version then includes fossil shark's teeth (Glossopetrae or Lingui di San Paolo) as an ingredient, together with Cananor Stone; the alternatives omit either or both of those ingredients.

A brief examination of the original components of the Goa Stone confirms its supposed efficacy. By the time of its invention in the mid-seventeenth century, bezoars were being used less frequently in Europe 'by Reason of the Iniquity of the Times, and its extravagant price, or that it grows out of Fashion'.[25] Nevertheless, Pomet was able to recommend it as 'a Preservative from pestilential air', and in the treatment of Pox, Measles, other contagious Diseases, Vertigo, Epilepsy, Palpitations of the heart, Jaundice, Colic, Dysentery, Bladder Stones ('Gravel') as well as in the promotion of labour and as an antidote to poison.

Figure 4. The Musk deer, showing the location of the caudal musk gland (from de Cuba 1483, *Hortus Sanitatis*).

Musk was utilised for fortifying the brain, refreshing 'decay'd spirits', dealing with wind, increasing sexual potency, treating deafness, resisting poisons, allaying the 'Vapours' during 'hysterical fits' of the womb, and discussing and rarefying 'gross Humours'.[26] In addition, it was deemed useful as a sudorific in cases of fever, particularly if attended with convulsions or hiccoughs.[27] Produced by a wide range of mammals, the oriental musk used for Lapis de Goa was almost certainly obtained from the Musk Deer (*Moschus* spp.), a relative of the cervids or true deer which inhabit forested and alpine scrub in south east Asia. The musk is produced by the caudal gland in males (Fig. 4). This is located in a sub-dermal sac lying between the genitals and the umbilicus. According to Pomet, the excised gland was dried and then transported in bladders before

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Table 1. Comparison of the components of Lapis de Goa in manuscript and printed versions of the recipe.

Identity	Portuguese name	Jesuit Archive, Rome Recipe 1	Jesuit Archive, Rome Recipe 2	Jesuit Archive, Rome Recipe 3	Pharmacopoeia Tubalense (1735)	Pharmacopoeia Bateana (1713)	Bradley (1730)	Palacios (1763)	Martin (1776)	Quincey (1782)	Linnaeus (1787)
Seed pearl	Aljôfar	X	X	X	X	X	X	X	X	X	
Musk	Almiscar	X	X	X		X	X	X	X	X	
Ambergrease	Âmbar griz	X	X	X	X	X	X	X	X	X	X
Red Coral	Coral vermelho	X	X	X	X	X	X	X	X	X	
White Coral	Coral branco	X	X	X	X	X	X	X	X	X	
Emerald	Esmeraldas	X	X	X	X	X		X	X	X	
Fossil shark's teeth	Linguas de S. Paulo	X									
Topaz	Topâzios	X	X	X	X	X	X	X	X	X	
Terra sigillata (Malta)	Terra branca de S. Paulo	X	X	X							
Ruby	Rubins	X	X	X	X	X	X	X	X	X	
Cananor Stone	Pedra de Cananor	X	X								
Jacinth	Jacintos	X	X	X	X	X	X	X	X	X	
Deer horn tips	Ponta de veado queimada	X	X	X							
Sapphire	Safiras	X	X	X	X	X	X	X	X	X	
Oriental bezoar	Pedra bazar Oriental	X	X	X	X	X	X	X	X	X	X
Camphor	Cânfora			X							
Spode (ashes, usually of bone)	Ispódio			X							
Garnet	Granadas			X							
Armenian earth	Bole arménio			X							
Unicorn horn scrapings	Raspas do unicônio			X							
Ivory scrapings	Raspas do marfim			X							
Crab's eyes (oculi cancrorum)	Olhos de caranguejo			X		X	X				
Water of Roses	Agua rosada					X	X	X	X	X	
Gold leaf	Solhas de ouro					X	X	X	X	X	
Ophiorrhiza mungos, the Mongoose Plant (root)	Radix Mungos										X
Angelica	Angelic. Afric.										X
	Serpent. Virg.										X
	Contrajerv.										X
Crab's claws	Chel. Marin										X
	Alcis philos. Ppt.										X
	Spin. Viperin.										X

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being stored in lead boxes in order to preserve its aromatic properties.[28] It is interesting to note that both bezoar stones and musk are still used for similar purposes in northern Pakistan today.[29]

Ambergris is a biliary secretion of odontocete whales such as the Sperm Whale (*Physeter macrocephalus).* Its origin was shrouded in mystery during the seventeenth century; because of its waxy nature, some thought it to be the remains of honey combs washed off of sea rocks during storms, whilst others asserted it was bird dung, or bituminous material released from the sea bed.[30] Probably most famous as a fixative in the perfume trade, ambergris was nevertheless widely used as a medical ingredient. By the late seventeenth century it was commended for its alexipharmic and aphrodisiac properties, as well as strengthening brain, heart and stomach, being useful in convulsions, haemorrhage and various nervous disorders, encouraging a lively disposition and making 'the spirits gay'.[31]

Seed pearls are naturally occurring pearls that weigh less than 14 grains, where one pearl grain is 50 mg. Again, commonly used as a medicinal component in combination with a wide range of other simples, it was esteemed as an invigorant ('cordial'), and was believed to be effective against a variety of infections, a means of settling digestive disorders, including 'Flux of the Belly'. It was also believed to 'recruit and restore lost Spirits'.[32]

During the seventeenth century, **coral** was considered to be a marine plant, and the polyps at the branch tips were described as flowers. Both red and white coral were collected primarily from the Mediterranean Sea by means of a crude type of bottom dragging. Used extensively in medicine as an alexipharmic, cordial and astringent, it was also employed as an absorbent in cases of diarrhoea, leucorrhea ('Fluor albus' or 'The Whites', characterised by a milky vaginal discharge), and haemorrhage.[33]

Cervid deer provided a wealth of material for medicinal purposes. The velvet covered horn tips ('**Cornu cervi**') were commonly rendered into a glutinous, protein-rich material referred to as Hartshorn jelly. This was also made using scrapings from the horn, which could also be pulverised and used to form infusions ('ptisans'). Deer horn preparations were believed to be 'nutritive and strengthening'.[34] In the context of the Lapis de Goa, the jelly might have been employed as a useful binding agent.

Terra sigillata is a sealed or stamped earth. Originally produced on the Greek island of Lemnos, a bole or soft, fine clay was pressed into small tablets or cakes and then stamped. During the time of the Greek physician Pedanus Dioscorides (circa AD 40-90), the image of a goat was pressed into the surface. This was replaced by a picture of Artemis (Diana) around a century later, and later still by the seal of the Turkish empire.[35] Similar earths were produced from a wide range of localities in addition to Lemnos, and usually identified by a particular suffix. The manuscript recipes for Lapis de Goa indicates that 'St Paul's earth' was used. Often called 'Terra melitensis', this was produced from the grotto at St Paul's Church in Rabat, Malta. All earths were acknowledged as having absorbent and astringent properties, but St Paul's earth was esteemed as highly as that from Lemnos when it came to its use as an antivenin. The acclaim of the Maltese earth derived from its association with the Pauline cult on the island. Shipwrecked on Malta on his way to Rome in AD 60,[36] St Paul is recorded as having had an incident with a viper. The snake fastened his teeth onto the apostle's hand, but St Paul suffered no ill effects (Acts 28:3-6). Maltese folklore records that Paul subsequently cursed all snakes on the island, ridding the land of them completely. So great was the miracle working power of St Paul, that the very rocks are now replete with physical representations of his anatomy (for example, his tongue is embodied in the large triangular teeth of the fossil shark, *Carcharodon megalodon*, and his breasts are represented by isolated plates of the fossil echinoid *Stylocidaris melitensis*).[37] So great was the power of his words against the poisonous reptile that the ground itself was imbued with the properties of an antidote. Since St Paul is believed to have spent most of his time in the grotto at Rabat whilst on Malta, rocks at that location were naturally more potent, and considered to be a particularly efficient remedy for snakebite.[38] Jesuits were very active on Malta in the sixteenth century, founding the Collegium Melitense, a forerunner of the University of Malta, in 1592, until their expulsion from the island in 1769. It would have been a fairly simple matter to supply the brothers in Goa with Maltese terra sigillata for use in Goa Stone production.

A number of precious stones[39] were included in the recipe for Lapis de Goa. The **emerald** is a gem variety of the beryllium silicate mineral, beryl. The distinctive green colour is due to the presence of chromium in the crystal lattice. By the mid-seventeenth century it was known from a wide range of localities including mines in Peru, Pakistan, and Egypt. As a medicinal ingredient, it was commended for its supposed diuretic properties, being used to treat bladder stones and other renal problems, as well as gout. Sir John Hill (circa 1716-1775) acknowledges its effectiveness against haemorrhages and diarrhoea, but suggests that rock crystal is a favourable alternative in these situations.[40]

Topaz is a fluorine-rich aluminosilicate mineral which displays a wide range of colours. At the peak of Lapis de Goa manufacture it was being actively produced from numerous locations including Arabia, Sri Lanka and Pakistan. Pomet recommended its use in any condition where bleeding took place, to which Hill adds its use as a cordial and a sudorific, commenting that contemporary English apothecaries stocked a somewhat untrustworthy mineral obtained from lead mines (fluorspar?) under that name.[41]

Jacinth is a red, gem variety of the mineral **zircon** (zirconium oxide). Also known as Hyacinth, it was used variously as a restorative with moderately astringent properties, occasionally as a hypnotic, and as a cordial, although Hill remarks that 'these Virtues stand but on a precarious Footing of Credit'.[42]

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Ruby is a red, gem variety of the aluminium oxide mineral, corundum. Sir John Hill says it is 'improbable' as a medicine, but records the fact that it was long esteemed as 'the highest of all Cordials', while Pierre Pomet adds that it was famed for 'resisting Poyson, strengthening the Vitals, driving away Melancholy, restoring lost Strength'.[43]

Sapphire is another variety of corundum, but this time coloured anything other than red. Like rubies, sapphires were commonly mined in Sri Lanka, as well as other localities. This gem was believed by Pomet to be effective at 'fortifying the Heart and other noble Parts, purifying the Blood, resisting of Poyson, … stop Fluxes, sweeten the Blood, and dry up Ulcers of the Eyes'. Sir John Hill remarks that it had

> very great Virtues as a Cordial, Sudorific, and Alexipharmic; but we have no good Testimony of any Body's ever having found this by Experiment.[44]

Of the two additional materials included in some of the manuscript recipes, **Cananor Stone** is the most obscure. Presumably it was rock or soil excavated at that town in Kerala State, south east India. The 'Linguas de S. Paulo', however, refers to 'St Paul's Tongues' or **Glossopetrae**, which have been cited above. Although found in Tertiary rocks throughout Europe, these large triangular, serrated fossil shark's teeth (*Carcharodon megalodon*) have a particularly strong folk medicine heritage in Malta.[45] Indeed, a thriving export trade was set up from the island from mediaeval times onward. Employed most commonly as an antidote to poison, they were sometimes hung in silver mounts on elaborate coral 'trees', forming a Natternzungenbaum ('Adder's Tongue Tree') or Languier. These items of furniture graced the credenzas of European noblemen. The teeth were examined for 'sweating' or colour changes in order to detect the proximity of poisons, or were dipped into the wine served with the meal.

Recipe 3 includes, as additions, a further seven ingredients. **Spode** was accounted one of the 'foulest and coarsest' of medicinal materials, consisting of the pulverised remains of material encrusted on the inner surfaces of the furnaces used to smelt copper[46] or to calcine bone. **Camphor** is an aromatic oil obtained from the Camphor Laurel (*Cinnamomum camphora*). It was very popular as an anodyne, diaphoretic, 'Resister of Putrefaction' and was widely used in the treatment of kidney, bladder, and uterine complaints, as well as 'deliriums' and gonorrhoea.[47] **Garnet** was generally obtained from sedimentary placer deposits and declined in popularity through the eighteenth century. In earlier times, it was believed, largely on the basis of colour, to 'cheer the heart', but was also used to combat 'pestilential Diseases'.[48] **Armenian earth** was used as a vulnerary (for treating wounds) and an astringent to counteract swelling. It was also prescribed for diarrhoea, bleeding, and catarrhs.[49] **Unicorn's horn** (actually narwhal incisors or mammoth ivory) enjoyed extensive use as an antidote to poison, as did elephant ivory. **Oculi cancrorum**, or 'crab's eyes' are actually calcareous gastroliths formed in crayfish. They were a popular ingredient in a range of medicines, and used in the treatment of pleurisy, asthma, bladder stones and colic.[50]

Thus, the manuscript recipes for Goa Stone in the Jesuit archives in Rome reveal a combination of ingredients that, collectively, 'improved' on the properties of increasingly scarce bezoar stones. From the item by item discussion above, it is obvious that most of the components which were blended together were believed to have a strengthening or invigorating ('cordial') effect on the person – particularly their spirits or their heart; the precious stones had an especially strong pedigree in this regard. In addition, many of the simples were chosen for their alexipharmic properties in order to adequately compensate for the reduced proportion of bezoar. Although a facsimile of a naturally occurring medicament, the Lapis de Goa benefited from additional ingredients which could increase the potency of the preparation synergistically.

4. Later recipes

The earliest published account which I have been able to find which includes the components of the Goa Stone is that of the *Pharmacopoeia Bateana*. George Bate (1608-1669), who sometimes wrote under the pseudonym of Theodorus Veridicus, was physician to Charles I, Cromwell and Charles II of England.[51] His *Pharmacopoeia* was published posthumously (first edition, 1688), having been compiled and edited by Jack Shipton from prescriptions which the apothecary had prepared for Bate's patients at the doctor's request. The entry for Lapis de Goa is quite brief in the first (Latin) edition of the *Pharmacopoeia*, but was considerably expanded by the time of William Salmon's 3rd edition published some eighteen years later. Notice that the recipe itself is very close to the manuscript originals (Table 1), but for the fact that rosewater replaces the Deer Horn tips.[52]

Bate's instructions for compounding the Lapis de Goa run as follows:

> Make all into fine Pouder, which bring into a Paste with Rose-water, and form into oblong Balls, not much unlike to little Eggs, drying them well in the Shadow: then with a Limpets Shell, or some other thing of like nature, let them be curiously polished, that they may have a Gloss upon them, S.A.

Salmon adds the editorial comment that the stones are somewhat brittle when rosewater is used as the binding agent, recommending that ingredient should be replaced with Gum Tragacanth or Hartshorn Jelly, as in the original recipe, with the added advantage that a better polish could also be produced on the stone surface.[53]

Bate recommends the artificial stones as a 'Specifick against Cramps and Contractions of the Nerves', while Salmon adds his own opinion that they are:

> an Antidote against Plague and poison, and cures the Bitings of Serpents, Mad Dogs, or any other venomous Creature. It revives the Spirits, chears the Heart, fortifies Nature, resists Melancholy, restores in Consumptions, prevails against all Diseases of the Head and Brain, proceeding from Cold and

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Moisture. It causes a lively Presence, nimble Wit, a pleasant Countenance and a sweet Breath.

The later recipes published in the Portuguese *Pharmacopoeia Tubalense* (1735) and by Richard Bradley, Professor of Botany at Cambridge (1730), the Spanish apothecary from Madrid, Félix Palacios (1763), Benjamin Martin (1776) and John Quincy (1782) are remarkably consistent, omitting the Terra sigillata, Cananor Stone, Deer Horn and Fossil shark's teeth of the manuscript recipes, but often retaining the Oculi Cancrorum commended in the *Pharmacopoeia Bateana*, and specifying the use of gold leaf.[54] Quincy does make the comment that the exact recipe was uncertain, and that the domestic copies which they were manufacturing were less popular than imported stones 'because we have not the skill in the polish'.[55] Only the recipe of 1787 given by Linnaeus[56] is dramatically different, in which ambergris and bezoars are the only two ingredients retained from the original manuscript recipes, and a plethora of other materials, mostly botanical, are added (Table 1). According to Palacios, this particular concoction was useful in balancing the humours, absorbing excess acid in the blood, and lifting the spirits, as well as being used in the treatment of fever, smallpox and measles.[57]

By the late 1760s, substitute recipes began to abound, mostly in the light of the understanding that the inclusion of precious stones in the mixture added nothing to the stone except additional cost. The Goa Stone sold in the shops was apparently then made of crab's claws, oyster shells, musk, ambergris, all mixed into a paste with the addition of rose water and gum Arabic. This was then rolled out onto gold leaf which, when dry, was given a superficial polish with a cloth.[58]

The Goa Stone is described as being 'of a dark green Colour, mixed with Gold Streaks, in shape almost of a large Olive, cutting very fine within, of a gray colour'.[59]

(To be concluded in the September 2010 issue.)

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A time of transition: Thomas Mayleigh – pharmacist or physician?

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In late spring 2001 Dee Cook, the Archivist at the Society of Apothecaries, had brought to her notice a well preserved leather-bound volume dating from the late 17th century and containing a family history. Preserved in private hands it recorded the family births, marriages and deaths between 1693 and 1828 of a York family, the Richardsons, the last entry being the death of Sarah Richardson on 12th January 1828. Passed down since then through five generations of the Richardson family it had been preserved rather like a family bible and provided a wealth of information on family history. Of interest to other historians was the fact that if you turned the book over and looked at it from the other end it appeared to be an account book the title page of which read:

> Thomas Mayleigh of London. His account currant in trade for each year from first entering into business October 1693, and also the births and burials of his children and relations with the place of their interments.

Dating between 1693 and the 1730s the accounts end of the book turned out to be a find of considerable significance. The connection was that the said Sarah Richardson (b 1750/1), who had settled in York and married a tanner called Isaac Richardson, was Thomas Mayleigh's granddaughter. Hence it was through this Sarah and through five subsequent generations of Richardson's that the account book survived, largely because the reverse end had been used rather like a family bible to record births, marriages and deaths.

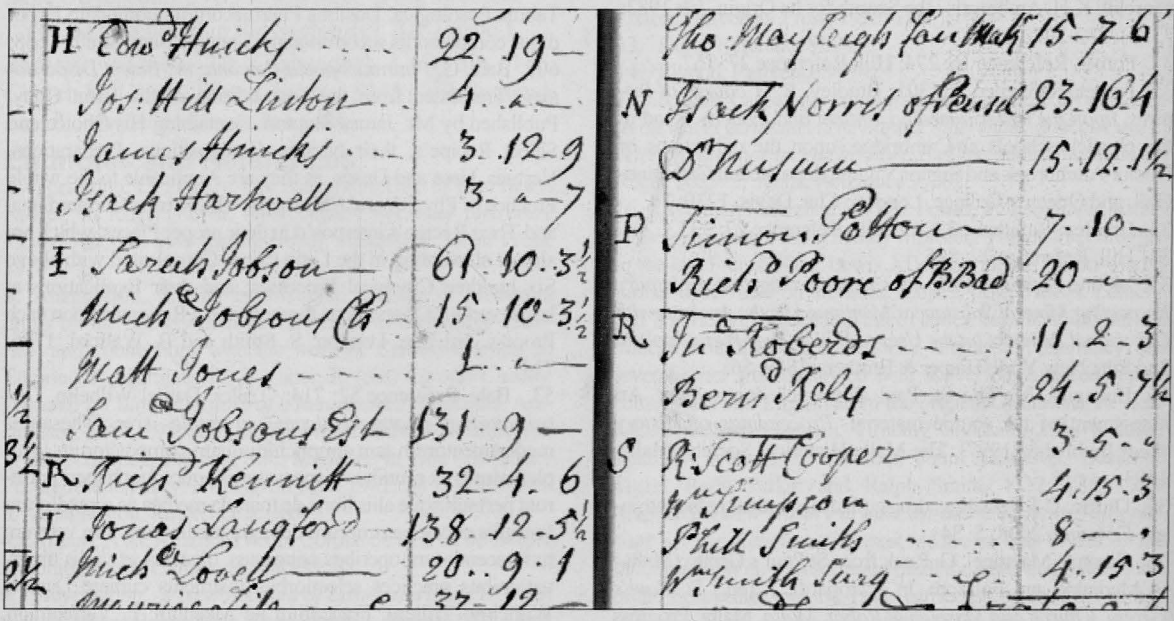

Figure 1. A page from the account book of Thomas Mayleigh. Note reference to Richard Poore.

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Thomas Mayleigh receives a passing mention in what are probably some of the most important early works on the history of British pharmacy. *Plough Court – the story of a notable pharmacy* was published by Allen and Hanburys (now part of GSK) in 1927, and told the story of the company's origins at the famous Plough Court pharmacy just off Lombard Street in the City. The publication had originally been entrusted to the biographer of the Hanbury family, Amy Locke, more than a dozen years before, intending for it to be published to celebrate Allen and Hanburys bicentenary in 1915. However Locke died before the work was much progressed, and the Great War disrupted work for many years before Ernest Cripps was entrusted to finish the task.[1] Cripps was a pharmacist and member of the staff at Allen and Hanburys factory in Bethnal Green. Later, other histories of the company followed: in *Through a City Archway*[2] Cripps and his collaborators brought the story of Allen and Hanburys to the 1950s, and later Geoffrey Tweedale contributed *At the Sign of the Plough* in 1990.[3]

According to Cripps, the Plough Court pharmacy was said to have been established in 1715 by one Silvanus Bevan at number two Plough Court, off Lombard Street. By tradition this was also held to be the birthplace in 1688 of the poet Alexander Pope. Cripps stated that the premises were in the hands of a linen draper, Salem Osgood until 1715. In that year, Bevan, born in Swansea in 1691, took over the lease of 2 Plough Court having qualified as an apothecary in July. In due course Bevan apprenticed his brother Timothy and it was Timothy's son Joseph Gurney Bevan who was, much later, to take on William Allen as a Clerk, thus starting the long association of the name Allen with the Plough Court pharmacy.[4] Indeed the continuing use of the Plough logo on many Allen and Hanburys products shows how the link with Plough Court has remained as part of the history of GlaxoSmithKline, one of the world's largest pharmaceutical companies.

Figure 3. Plough Court pharmacy.

Figure 2. Apothecaries Hall.

However, a small detail that Cripps had picked up was of Bevan's apprenticeship. Cripps had found in the archives of the Society of Apothecaries the following from the Court minutes:[5]

> 1715. July 5th Silvanus Bevan. Apprentice of Thomas Mayleigh, having served 7 years and paid a fine of £6:9:0 for ye remainder of his time according to Ye order of Court of assists, was examined, approved, sworne and made free.

Having made, according to Cripps, the briefest of appearances as the apothecary who trained the founder of one of the world's largest pharmaceutical businesses, Thomas Mayleigh, more or less disappears from view. Indeed, Tweedale in 1990 dismisses Mayleigh with the words:[6]

> It is not known who Thomas Mayleigh was – possibly an apothecary in Cheapside.

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None of the researchers at the time seem to have consulted the Society of Apothecaries' archives in any depth, since otherwise they would have discovered that in 1727 Thomas Mayleigh was prominent and respected enough to have been elected as an Assistant to the Society's Court. Nevertheless, for most of the 20th century, Mayleigh was little more than an enigmatic footnote in the history of pharmacy and medicine.

The discovery therefore of extensive account books covering most of Mayleigh's life is one of considerable significance in its own right. And because they are kept in good chronological order, they can be cross referenced with other sources such as City tax assessments held at the Guildhall and the Court minutes at the Society of Apothecaries. Moreover, since the Mayleigh family were Quakers, more can be gleaned from various records from the Society of Friends. The account book contains more than thirty years of trading accounts, and by recording family history as well it ties down dates, people and places, of which the most interesting were the birth records of the Mayleigh children recording all but the eldest as having been born at the sign of the Black Swan and Plow.

This statement gave rise to the conjecture that Mayleigh's premises might be at Plough Court. Could Mayleigh have been the real founder of the Plough Court pharmacy and was Silvanus Bevan merely his apprentice that took over? Finding an earlier record of a Plough Court Pharmacy, possibly placing the founding of Allen and Hanburys back to the late 17th century, would be an important discovery bringing the origins of GSK close to the founding of the world's oldest pharmaceutical company, Merck, created in 1668 from Frederick Merck's Angel Pharmacy in Darmstadt Germany.[7] The importance of this quest was more so since the Plough Court Pharmacy and Allen and Hanburys are linked with the name of William Allen, one of the founders and indeed the first President of the now Royal Pharmaceutical Society.

According to the account books, Thomas Mayleigh, of whom there is no known portrait, was born on 5th October 1671 the son of Thomas Mayleigh senior, also an apothecary, and of his wife Abigail. This elder Mayleigh possibly migrated to London from Wales and the Court Minutes of 18th May 1675[8] record that he paid a fine of £25 (equivalent to over £2000 today)[9] to be made free of the Society. Since the elder Thomas was admitted to the Society by redemption, the assumption has to be that he had been practising as an apothecary elsewhere in the country prior to coming to London. Whatever else, by 1693 he and his family were settled in Wapping next door to the King's Head tavern near Hermitage Stairs, just east of what is now St Katherine's Dock. Since the elder Mayleigh had purchased his membership of the Society, this allowed the young Thomas to be admitted to the Society by patrimony in 1693[10] and in the same year he set up in business on his own account,[11] although exactly where at first is not clear. In doing so he was helped with £20 from his father, Thomas Senior, and also with £100 from Samuel Jobson his future father in law, for he was to marry Hannah Jobson daughter of Samuel and Elizabeth Jobson of East Smithfield in December of that year.[12] As was usual with Quakers of the day, permission to marry was sought from church elders.

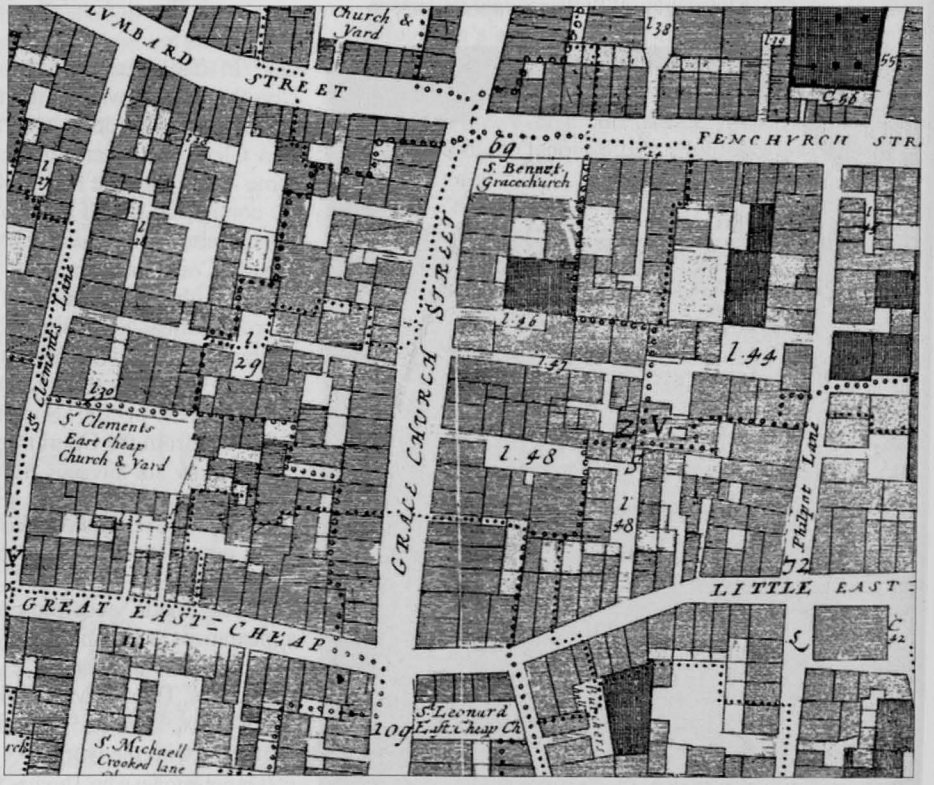

Figure 4. Gracechurch Street, Mayleigh's pharmacy was probably on the right hand side. Plough Court is the large L-shape space just south of Lombard St.

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In 1695, Mayleigh records in his books that Hannah had their first child on 1st May at her grandfather's house in Wapping. Named Abigail after her grandmother, the birth was attended by a midwife, a nurse, 'Dear Mother Mayleigh', a cousin, an aunt and 'divers in the neighbourhood'. The same year, Mayleigh records that he moved into a larger house and shop and in that December the list of Bridge Ward inhabitants in the City shows him to be an inhabitant of the Upper Precinct of St Leonard's Eastcheape.[13]

At the end of the year 1695 his balance shows retained amounts of £325.13s.8d (equivalent to about £28,000 today).[14] As in 1694 he shows three types of income for the business: cash from the retail; cash from the wholesale; and cash from the physical. To the pharmacy eye this is showing a mixed business with wholesale dealings perhaps to other apothecaries, some retail sales over the counter, but what is the physical business? Is Mayleigh here engaging in some hands-on treatment? This entry relates to 1695, just six years before the Rose case, when William Rose, an Apothecary of St Nicholas Lane, St Martin's in the Fields, was prosecuted by the College of Physicians for practising medicine when he prescribed and dispensed for a butcher called Seale. Rose's case, with the support of the Society of Apothecaries, went all the way to the House of Lords, who judged in Rose's favour by finding he had not acted illegally in treating Searle. It was this judgement that gave the legal sanction to the right of an apothecary to practise medicine.[15] It is possible of course that Rose and Mayleigh knew each other and Mayleigh would undoubtedly have known about the case. Was Mayleigh, with his 'physical business' also in the forefront of these new clinical developments, and was he perhaps simply lucky to get away with it so far?

The next year, 1696, started with something we will all be familiar with, a tax demand, because Mayleigh was assessed for 10 shillings Window Tax in March.[16] However, in September came the birth of Thomas and Hannah's second child and the first to be born at their new home, for on the 2nd September Elizabeth Mayleigh arrived, but significantly, Mayleigh records the birth as being 'at the sign of the Black Swan and Plow in the parish of St Leonard's Eastcheape'.[17] The inhabitants list of December that year, held in the Guildhall Library, confirm a Thomas Mayleigh as an inhabitant of the Upper precinct. This pattern repeats itself for several years. In 1697/98, Mayleigh's book records the granting of his Freedom of the City during the mayoralty of Sir Humphrey Edwin, and two more children are born, Thomas on 9th January 1697/8 and Mary on 15th May 1699, both at the sign of the Black Swan and Plow in Gracechurch Street. Meanwhile, each December Thomas is listed amongst Bridge Ward inhabitants in the upper precinct of St Leonard's Eastcheape. This begs the question–where is the sign of the Black Swan and Plow, Gracechurch Street, being only a couple of alleyways away from Plough Court?

However in 1698 the Guildhall's Poll tax records show that Salem Osgood, a linen draper with his wife, child, three servants and a manservant are living in Langbourne Ward,[18] while Mayleigh is still in Bridge Ward. This is relevant because we know that later, in 1715, Silvanus Bevan, Mayleigh's erstwhile apprentice, took over number 2 Plough Court from Salem Osgood, later leases confirming that the property had been held by Salem Osgood's father since 1679.[19]

Hence Mayleigh's apothecaries' shop has to be somewhere else; indeed it has to be in Gracechurch Street, and not in the nearby Plough Court. Therefore the theory that Silvanus Bevan somehow took over an existing business is well and truly put to rest. Silvanus Bevan's Plough Court pharmacy was indeed a new venture and did not trace further back through the Mayleigh family.

However, the Plough Court story is just a sideline to the now developing tale of Mayleigh and his practice, and the wealth of detail provided in the account books is too good to ignore. In particular, the year 1700 brings changes that help us to understand what was happening. Mayleigh's books for example record that on 15th September, Hannah Mayleigh was born at the sign of the Black Swan and Plow ***formerly*** the Black Boy in St Bennet's Gracechurch Street. Furthermore the Bridge Ward inhabitants list that December has him as an inhabitant of the Lower Precinct of St Bennet Gracechurch Street, and missing from his place amongst the previous list of his neighbours in the Upper precinct of St Leonard's Eastcheape. Hence sometime between December 1699 and September 1700, Mayleigh moved house and shop once again, a little further up Gracechurch Street. Significantly however, he must have still used the sign of the Black Swan and Plow, on his new premises replacing a former sign of the Black Boy. Any lingering thought that the sign indicated that Mayleigh's premises were in Plough Court are finally dispelled by this evidence.

Clearly, by 1700 Mayleigh's business was prospering, but what can we tell from the accounts at this time? The accounts are not set out in a modern way and are not comprehensive but are frequently more of an end of year summary or balance. Mayleigh clearly kept other books at this time, since he refers to disbursements from his cash book and later from various other folios. Each year he refers to income from physical, retail and wholesale business, and as well records separately the additions he has made to his stock of medicines and drugs, utensils of trade and to household goods, plate and linen. On the other side of the account he records the balance left to be carried forward at the end of each year, which by 1700, his eighth year in business, amounted to £407.7s.6d. By 1705 his balance is up at £531.1s but

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the next year 1706 shows a substantial cash injection when £926 is allocated to 'Cash by GER'. By the same token cash 'by separate trade' occurs on the other side of the balance for the first time. Who or what is GER that suddenly added to his prosperity and what is the separate trade he refers to so enigmatically? Is it possible that it was a euphemism for something, perhaps even an involvement in the slave trade? There are no clues in the books, but what becomes quite clear is that the 'separate trade' continues for many years.

Over the next few years Mayleigh continues to trade and keep simple accounts, and in 1708, apparently for the first time, he takes an apprentice in Silvanus Bevan. The Court minutes record Bevan as being of Swantzoy or Swansea in Glamorgan, the son of a merchant and that he was bound for eight years.[20] However the account books make no special mention of Bevan although it can be speculated that the additional trade now coming in warranted an increase in the size of the work force. November of that year also brought the birth of another child to the Mayleighs, again recorded as being born at the sign of the Black Swan and Plow formerly the Black Boy. This child, a daughter, was the third to be named Sarah, two others of the same name having died as infants. It was this Sarah who was to survive and to whom we owe the preservation of the books since it was her daughter who married into the York Richardsons.

1709 brought changes for the family. On 21st February Thomas Mayleigh Senior died of dropsy in Wapping at the age of 80,[21] quite a number of years after Mayleigh's mother, who had passed away in 1695.[22] Mayleigh's account books start to record more detail, and show that he inherited much of his father's estate. Thomas Senior must have been quite successful himself since he left Mayleigh estate at Longford valued at £800 (£60,000 today)[23] and in addition Mayleigh adds land that appears to be his own in Pennsylvania to the value of £200. In clearing his father's estate he pays tradesmen to the value of £284 but clearly makes a substantial sum from his 'separate trade' in addition to his wholesale, retail and physical trade. He starts to list money that is due to him and regarded as 'good debt', and all in all he ends the year with a balance of £3842.19s having started the year at £1108.4s.5d, thus tripling his wealth. A clue to what the separate trade might be however occurs in 1710 when the entry appears: '*By divers debts of separate trade due of* ***this estate*** [his father's] *December 25th 1710; £514.1s.10d.*' Additionally Mayleigh records outstanding debts in the wholesale and physical business, separately from 'Divers debts in the separate trade'.

Rather than slavery, is it possible that Mayleigh was accounting for the business of his father as well? Was this the separate trade? His father had died in 1709 aged 80 but the separate trade had been shown

Figure 4. Timothy Bevan 1704-1786

since 1706. Perhaps Mayleigh had been helping out in his father's infirmity by running the Wapping business too? What is possible is that Mayleigh's future overseas trade may well have derived from the prime position of his father's shop. We know from the birth record of Mayleigh's first child that Thomas Mayleigh senior's house was 'in Wapping next door to the King's Head tavern near Hermitage Stairs'. This was right in the Lower Pool of the Thames where huge numbers of ships would have been brought for unloading. Perhaps Mayleigh's connections with overseas trade were a result of the connections he and his father had forged with those sea captains who climbed the Hermitage stairs on route to the King's Head? It seems highly likely. The nearby Hermitage Dock was constructed between 1590 and 1658, and must have been a busy place when Mayleigh senior was active there.

1710 brings another mention in the Society of Apothecaries minutes in that Mayleigh was called to act as a steward for a herbarizing expedition on July 4th.[24] This meant he would have to pay for the food for these botanical expeditions, which had become a regular feature of the Society's life.

From 1711 the format of the accounts clearly changes and starts to become much more detailed. What's more, we know why, because Mayleigh tells us in the account book where a note says *'True statement of my account taken from folio 42 of my Grand ledger settled by Hammond my bookkeeper'.*

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This is an indication that the business is now big enough to employ a bookkeeper. For the first time there is reference to an estate in Low Leyton in Essex and also a payment for the White Hart, Bermondsey. The accounts are also set out differently showing that the new man Hammond had his own ideas on how best to keep his employer's books. For the next year, 1712, a huge amount of detail is shown. There is a short statement of debtors of the physical trade, and then a long alphabetical list of both debtors and creditors in the general trade. A look down this list shows Mayleigh bought lottery tickets, which could well have been part of the state lottery to raise funds for the ill fated South Sea Bubble. He traded with customers in Antigua, in Barbados and in Pennsylvania, and significantly, he paid for voyages to Carolina and Jamaica, presumably going himself to set up trading links. Furthermore we have cross referenced evidence from the accounts of Richard Poor,[25] a Quaker merchant in Bridgetown, Barbados that Mayleigh had supplied him with medicines including Lockyer's Pills, an overpriced version of antimony.[26] In the same year Mayleigh pays taxes for windows, lamplights, scavenger and, apparently, Thames Water. However £11 is paid as Bible money, perhaps a contribution to Quaker funds and he also pays out to Sarah Jobson and to the Estate of Samuel Jobson his father in law. Perhaps an annuity was being given to support remaining relatives.

But 1712 also brought the birth of his twelfth and last child, Mary, in April. As confirmed in the Quaker records,[27] the child died as an infant, as had five others, but although the episode is recorded in Mayleigh's usual format in the books, it is in a quite different hand.[28] It might be conjectured that this is the hand of Hammond the bookkeeper, and perhaps that Mayleigh was away in the colonies at the time. This seems to be a plausible explanation and a confirmation perhaps of his voyages.

The years 1713, 1714 and 1715 only get the barest of mentions in Mayleigh's account books, showing just simple balances and making reference to opening a new ledger, and to the relevant folio numbers. Clearly Hammond was still reorganising the office. As before, City records taken every December have Mayleigh still resident in the Lower Precinct of St Bennet's in Bridge Ward, with the birth records in the account books narrowing this down to somewhere along Gracechurch Street itself. However despite a relative paucity of information during those years in Mayleigh's surviving books, the Court minutes of 31st August 1714 record Mayleigh as being summoned to hold steward for the King's passage through the city. This would most likely have been on the accession of George I and part of his state entry to the City. It is probable that in this Mayleigh would have been one of the Livery required to provide dinner on the day, but the minutes later record that he did not appear.[29] Quite why this might be so is not known, but it is entirely possible that he was out of the country at the time.

1715 shows a further entry in the Court minutes, this time, of the only detail that Cripps had picked up, the end of the apprenticeship of Silvanus Bevan and the granting to him of the freedom of the Society. It is perhaps significant that Mayleigh's accounts in 1716, which now become much more detailed, show a payment to Bevan's father of £6.0s.0d perhaps accounting for some sort of reckoning after the end of the apprenticeship.

Whatever else, 1715 was a significant year for the former apprentice Silvanus Bevan since this saw not only the end of his apprenticeship, but also his subsequent marriage and probably of his starting in business at the Plough Court pharmacy. On 10th November, Bevan, stated on the marriage licence to be of Cheapside, married Elizabeth Quare, daughter of Daniel Quare, Clockmaker of Exchange Alley.[30] Quare was Clockmaker to the Royal Court and so the wedding was something of a Society event. We are fortunate to have a letter describing the wedding from Rebecca Osgood, a guest and incidentally the daughter of Salem Osgood the original owner of 2 Plough Court. The description in this letter leads Cripps to the conclusion that the Osgoods moved out of Plough Court late in 1715 allowing the newly married Bevans to take up a sub-let of the premises. The evidence for this is thin, although it is clear that Bevan was in possession of the premises by 1725. However what is of interest to our story is that of the many wedding guests that signed as witnesses to the Bevan–Quare marriage, Mayleigh is conspicuously absent.[31]

Why was Bevan's apprentice Master, with whom he would have lived for seven years, not a signatory to witness his wedding? Was he there but just did not sign? Had he and Bevan fallen out, perhaps because Bevan's new pharmacy was on his doorstep? Or was he simply abroad at the time? We may never know, but aside from the settlement of the account in the following year with Bevan's father in Wales, the paths of Bevan and Mayleigh seem to hardly ever cross again.

For the next five or so years up to 1720 the Mayleigh accounts record debtors and creditors including trade and voyages with the American and West Indian colonies. Barbados, Jamaica, Carolina and Vera Cruz in Mexico are all mentioned, although whether Mayleigh went or is just recording the cost of transporting merchandise is not clear. Trade was taking place with clients in Maryland, Philadelphia and elsewhere; there is income from his properties and estates as well as details of payments made to Thomas Mildred a cutler, Thomas Port a jeweller and a gunsmith named Williams. In 1718 there is also payment of £450 on the account of the Ship *Neptune;* another a year later refers to £700. It seems that Mayleigh took a share in vessels that were trading

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across the Atlantic, for in addition he appears to account for £1200 of sugars (worth in the region of £100,000 in today's terms)[32] held in hand on his sundry account so he was clearly involved in the plantation trade. As well, there are several accounts, as perhaps might have been expected, for £40 (about £3,400 today)[33] with the 'Elaboratory' at Apothecaries' Hall. It is quite possible that this may have been an investment made by Mayleigh as a subscriber or shareholder in either the Laboratory stock or possibly in the Navy Stock businesses that were set up in the Hall to produce good quality medicines. However although the full list of the first Proprietors in the Navy Stock from 1703 cannot be reconstructed, Reginald Dennison, Clerk to the Society from 1756 to 1776 recorded that ninety-nine Proprietors subscribed £50 and thirteen subscribed £40, the latter figure being identical to the sum recorded as going to the 'Elabratory' in Mayleigh's books.[34] Additionally there appears in the account books to be trade with a number of women, probably a Quaker trait since they were early pioneers of equality, and Quakers would accept women in business.

Unfortunately records are missing from the account books for the years 1721 to 1727 although in their place there is a much later pasted note in the accounts from the 1800's referring to money left in wills and annuities. This appears to be relating to members of the Richardson family into which, Sarah Mayleigh Barnes, Mayleigh's granddaughter, had married in 1779. However, despite this lacuna in Mayleigh's books we do know from records in the Society of Apothecaries archives that in 1727 Mayleigh was elected to the Court of Assistants,[35] so clearly he would by then been a prominent liveryman of the Society. The account books resume in more detail again in 1728, although in a different format and probably a different hand. Included in this are sums for a third part share in the Ship *Mary* including 'Insurance done at Mr Bullard's on ye Mary'. He also pays for wharfage, and amongst small bills, there is one of 18s 2d to Mr Wagstaff *'for tobacco had from him on my own account'*, and 10s 6d to Edward Fernley for *'a Hatt for T Mayleigh Junior'*. In April 1730 he sends a cargo to New England for the building of a new ship in which he is to take 1/16th part. There are also accounts for members of the Laune family, including William Laune; were these perhaps members of the de Laune family, descendants of Gideon de Laune who founded the Society of Apothecaries?

He also buys medicines and pays Major Leonard for rhubarb … perhaps an importer. In 1731 there are accounts for 'husbands account' meaning provisions, to the ship *Ashley* 'out and home'. This seems to indicate that Mayleigh himself might have been on the *Ashley*. However, during these latter years he was also serving on the Court, and hence must have been aware of the examination by the Court in 1731 of Timothy Bevan,[36] Silvanus Bevan's brother who had come to London and been apprenticed to his sibling. The Court minutes of 11th March record that he had been *'good an apothecary in the country and with his brother'*, perhaps implying that he had been apprenticed to an apothecary elsewhere before joining his brother in London. Timothy's admittance to the Society of Apothecaries is an important event, since according to Cripps he was eventually to join his brother as a partner in the Plough Court business. More significantly perhaps, it was one of Timothy's sons, Joseph Gurney Bevan who eventually took on the young William Allen, thus laying the foundation for the eventual development of Allen and Hanburys.

Returning to Mayleigh, he is recorded as being present at the Court in the Court minutes up to February 1732, being there for the meeting held on the 20th of that month. However in March 1732 there is an entry in the account books for payment to John Gale for physic, so perhaps this is an early indication that all may have not been well. Mayleigh appears not to be present at subsequent Court meetings in March and April.[37] Then on 19th May 1732, there is a further entry in the accounts for physic, this time to Thomas Dry and co for £4 2s 2d. However in the family part of the book at the rear, is an entry dated 1732 reading

Thomas Mayleigh. My dear father died ye 19th May in ye sixty second year of his age and was buried in Long Lane ye 25th from Gracechurch Street meeting.'

Thomas's unmarried eldest son Thomas junior did not outlive him long either, since he is recorded as dying on 19th December 1732, aged 35, followed by Mayleigh's widow Hannah, by then living in Camberwell, who died on 26th May 1733. Both were buried at Long Lane as well. Hence at this point the business in Gracechurch Street seems to have come to an end.

Mayleigh did however leave an extensive will.[38] His wife Hannah is named as his executor and Mayleigh

> … *earnestly desires all my children to behave themselves with the utmost respect, duty and affection towards my said wife, who hath been to them the best of mothers, and that they be loving and friendly to one another.*

This is a sign perhaps that Mayleigh did not always approve of everything his children were up to. Furthermore he clearly had little time for his sons Thomas junior and Samuel. The will points out that they have had money in advance but that each made *'a very ill use of it'* and it extols them to reform and to act dutifully towards their mother. While Hannah gets all the estates in Enfield, Stepney, Bethnal Green, Leyton and Bermondsey, Mayleigh's eldest son, Thomas junior, is to get just half of his estates in Pennsylvania, the other half apparently held in some sort of trust by Mayleigh's friends Humphrey Hill and Samuel Wilson. Furthermore, Thomas Junior was required to prove his worth in the business within three months or the inheritance was to be revoked in favour of his brother Samuel. Similar provisions were to applied to Samuel should he inherit in default of Thomas, so

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clearly Mayleigh trusted neither of his sons to behave in a way of which he might approve. We know from the Court minutes that Samuel had actually been bound apprentice to his father in 1718, but he seems never to have finished his apprenticeship, perhaps one of the reasons behind Mayleigh's dissatisfaction with his offspring. In the event, Samuel died just before his father in August 1731 whilst in Bengal, India, so Thomas junior inherited anyway. However following Thomas junior's early death in 1732, before that of his mother the following year, the estates passed down the female line.

Even that was not without controversy. One married daughter, Elizabeth, was not mentioned at all in Mayleigh's will, whilst another, Abigail, was to be given £200 a year after Mayleigh's death on the understanding she did not challenge the provisions of the will. The two unmarried daughters, Hannah and Sarah (who was to marry into the Richardson's) got the remaining portions of the personal estate, again with the proviso that they must not challenge it. Various other entailments and a codicil tied up the loose ends and seem to show that Mayleigh must have been something of a control freak who continued even in death to ensure that his supposedly wayward children did exactly what was required of them.

On the other hand, Mayleigh's two faithful friends mentioned in the will, the merchants Humphrey Hill and Samuel Wilson, who were to be trusted to supervise the two sons, got £10 each for their '*help with counsel and advice*'.

The account books themselves continue for about a year after Mayleigh's death, with some final reckoning of cash and one or two outstanding accounts including a payment to Mrs Mayleigh prior to her death for Mayleigh's 3/16th share in the ship *Prosperous Solomon*. However there is a great deal more to be investigated and this brief resumé just scratches the surface of Mayleigh's dealing.

However the question remains, from this evidence, of what was the nature of Mayleigh's trade? With a career extending for a respectable 40 years in business, he made a considerable amount of money over the years, and substantially expanded the property portfolio he inherited from his father Having started in 1693 he must have been aware of the Rose case in 1701 and of its implications. In his latter years, as a member of the Court, Mayleigh would have been aware of the growing involvement amongst apothecaries in treating patients themselves. From his earliest accounts in 1694, well before the Rose case, he was listing the physical business separately from the retail shop and from wholesale; £26.1s.2d for 1694, £56.19s.10d the next year, and £159.12s.2d by 1701 the year of the Rose's prosecution. These references to the physical business continue to appear until 1720 after which there is a gap and when the books resume in 1728 the format changes for that and for subsequent years and there is no further reference to the physical business. However, it seems clear that as different people wrote up the book as the years went along, they changed the nature of what was being recorded as well as keeping other separate folios. Since the 'physical business' had appeared in Mayleigh's books for over 25 years, the likelihood is that it still formed a significant part of his business in the later years even though the folios that might have recorded it have long been lost. Hence although the sums turned over for the physical business were smaller than those of other parts of the business, they were not insignificant.

Although he cites no evidence, according to Cripps,[39] Silvanus Bevan, who became a Fellow of the Royal Society in 1725,[40] practised as a physician and was known as Dr Bevan and the Quaker FRS. If true, is it possible that Bevan, as well as being apprenticed to Mayleigh in pharmacy, gained his early experience of medicine with him?

However there is little evidence in the account books of any payment to Mayleigh for attendance on a patient. There are plenty of references to the supply of medicines, payment of tradesmen, trade with the Americas and rents received, and indeed of payments to the laboratories at Apothecaries' Hall, but not a single reference to any medical attendance or procedure.

There is a substantial list of people who owe Mayleigh money one way or another, but against none is there any indication that any of them received physical treatment. Perhaps many were receiving physic from Mayleigh: the evidence however is just not there, so we may ask what was the nature of the trade he had with them? At present there seems to be little indication, hence the assumption must be that of the long list of people who owed him money, it would probably have been substantially for medicines, given that his stated turnover in wholesale and retail was significantly larger than his turnover in physical business. So in a time of transition was Mayleigh a physician or pharmacist?

My contention would be that he was very much a pharmacist, and I draw some parallels with what is happening with the pharmacy profession today in becoming more of a clinical profession. Mayleigh had been brought up in his father's pharmacy practice. He would have understood the pharmacy business inside out even when he was starting in 1693. Maybe after the 1701 Rose Case the route to 'practice physic' started to become clear, but it would have been taken up by younger practitioners like Bevan. Mayleigh perhaps saw his opportunities in continuing to trade in pharmaceuticals, and the burgeoning import-export trade across the Atlantic appealed to him. It seems likely that he reasoned that the new fangled medical practice should be left to the youngsters, there being plenty of good business to be had in trading pharmaceutical products without practising physic and prescribing as well.

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Pharmacy today is passing through the same transition. The manufacture, storage and supply of pharmaceuticals and medicines is being seen as less important now that pharmacy practice is moving to a more clinical role with the introduction of consulting rooms, medicine use reviews and prescribing by pharmacists. The distribution of medicines is being seen increasingly as something to be done by well qualified technicians. However the history of the Society of Apothecaries indicates that when pharmacists become increasingly clinical, they turn into physicians and someone else steps into the role of pharmacist.

Mayleigh's successors in the Society of Apothecaries became physicians, and their pharmaceutical role was, with few exceptions, taken on by the upcoming chemists and druggists like William Allen. For apothecaries like Mayleigh, it was indeed a time of transition even if he himself chose to remain with a traditional pharmaceutical role. Will history repeat itself with pharmacists becoming pharmaclinicians and with traditional pharmacy practice becoming the province of today's increasingly well qualified pharmacy technicians? Only time will tell, but the life of Mayleigh, now no longer just a footnote in medical and pharmaceutical history, perhaps has a lesson to teach us all; to be successful, it pays to stick to what you are good at.

This paper was the Gideon de Laune Lecture presented at the Society of Apothecaries on 29th April 2009.

Acknowledgements

Allen and Hanburys, Dee Cook, John Ford, Simon Dixon for research on Quaker records, Mrs P Jackson and Mrs E Cardale, descendants of Thomas Mayleigh.

Author's address: enelwood@btinternet.com

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Update on ISHP Website

Christiane Staiger, Neu-Isenburg

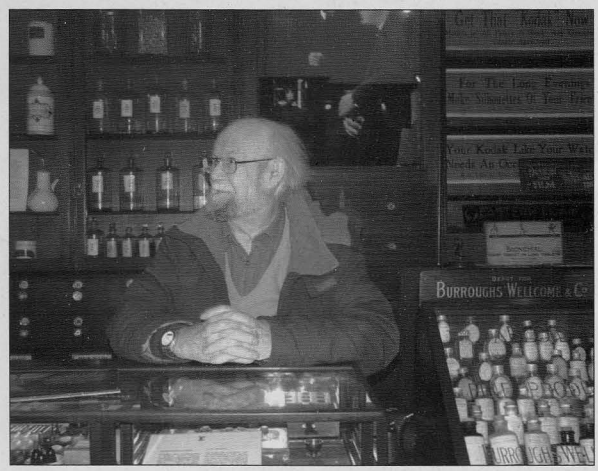
The homepage of the International Society for the History of Pharmacy (ISHP) has recently moved to a new server. As the website is no longer located on a public server the users are not bothered any more by advertisements or popup-windows. With the move came an update of all pages and functions of the homepage. The internet address is still the same: *www.histpharm.org*

The International Society for the History of Pharmacy was founded in 1926. The society was established to form an international centre for handling all matters of a pharmaceutical historical nature without commercial interests. Today, it is the head organization of 23 national societies. Aims and scope and the statutes of the society are available on the website as well as a list of all member organisations with contact details of the national societies. The pages 'Events' and 'News' give actual information about upcoming events and headlines in the history of pharmacy.

The category *Tools* hosts the ISHP oral presentation list, the Literaturefinder, the Imagefinder, the Grantfinder, and the Newsletter Archive, containing all ISHP newsletters from 2000 to the present. The Grantfinder tool is particularly useful for younger pharmaceutical historians. More than 30 grants and scholarships in the history of pharmacy, medicine, and science are listed. The Imagefinder offers material for the illustration of talks and presentations. Image-Databases with particular relevance to pharmacy and medicine history are listed and linked. The page lists one dozen databases worldwide.

The Literaturefinder on the ISHP homepage offers general information from several countries about worldwide literature databases related to the history of pharmacy and medicine. National flags indicate the pages' home countries. The short introductions include name, web address (URL), a description of the database content, and the available languages. The search strategy for each database is explained comprehensively and an example is given. A direct link takes the user to the related website.

The most important tool is the database *ISHP oral presentation list*. The page lists all talks given since 2005 related to the history of pharmacy worldwide. Beside the title the database stores the keywords, the name of the author and a contact email address. Date, place and occasion are also available. The database has been constantly enlarged and contains at present more than 1200 entries. Pharmacy historians are invited to notify their talks by email for inclusion in the oral presentation list.



Annual Spring Conference, Llanelli, 26-28 March 2010
Visiting the National Botanic Garden of Wales.
Top to bottom: the Great Glasshouse; Briony Hudson; Mr Tony Yoward in the old pharmacy. See also back covers.

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Review

A Glossop Pharmacy: The History of Pharmacy at 7 High Street West, Glossop. Hartley, Fay.

Bakewell: Country Books/ Ashbridge Press, 2010, pp. 83. ISBN 978-1-906789-19-0. Price £9.99 plus £1 p&p. Signed copies available from *finlay@mckinlayf.freeserve.co.uk*

At first glance one might be forgiven for thinking that it is a Sunday newspaper magazine. The cover is glossy and the book is A4 size. On closer inspection one sees that the front and back are covered with old pharmacy shop labels. A photograph of a coat of arms dominates the front cover, which we learn from the foreword was a 19th century warrant 'By Appointment to His Grace The Duke of Norfolk' and has proudly been displayed during the history of this pharmacy.

The author takes us through the history of a pharmacy in Glossop from its building in 1838 until the present time. At the same time she gives us a potted history of Glossop and the development of its High Street. There have been seven owners of the pharmacy, six of whom are given a chapter, with the seventh and most recent being mentioned in the last chapter. These are T. P. Wreaks, 1840–1869, R. Proctor, 1869–1897, W. J. G. Moran, 1897–1912, F. McKinlay (the author's grandfather), 1912–1951, Noel & Edith Oliver (the author's parents), 1944–2002 and the author herself, Fay Hartley, 1974–2006. The present owners are Y & A Patel, trading as Cohens Chemist.

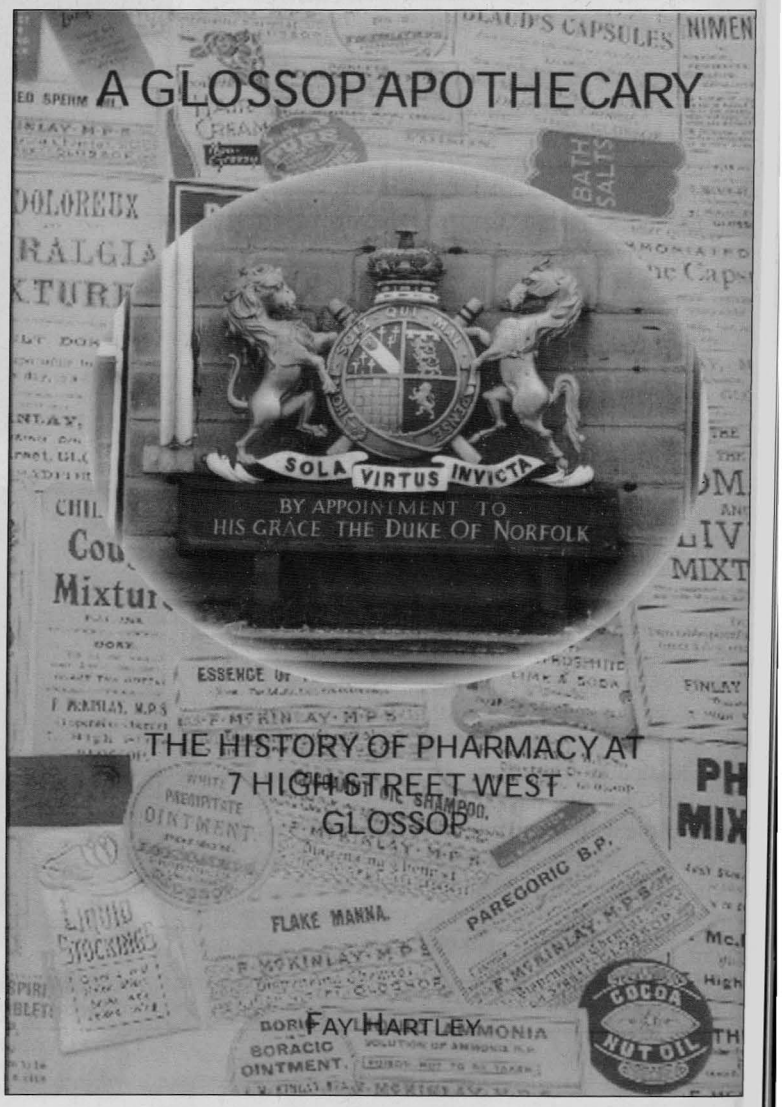
The book contains over 130 black and white illustrations including letters, labels, equipment used in the pharmacy, pages from catalogues, advertisements for proprietary medicines, entries in prescription registers, billheads, internal and external views of people and the pharmacy, and local views of Glossop.

The prescription register extracts are interesting and amusing. A page from August 1852 boasts prescriptions for the 13th Duke of Norfolk. From 1849, there is a Cholera mixture containing tincture of opium and catechu. My personal favourite is a veterinary prescription for a racehorse that has the formula: cocaine 13 grains, digitalis 20 minims [sic] quinine half an ounce and whiskey half a pint. It was to be given half an hour before the race!

Some of the anecdotes are amusing, in particular the introduction of electric lighting into the pharmacy in 1912 and the Duke of Norfolk's visit to the pharmacy in 1976

The impression is that this book has been written for the people in and around Glossop. The pharmaceutical facts have been well researched and an effort has been made to explain terms and procedures to the reader. I found the text easy to read and the quality of the photographs and scans are detailed enough to afford further reading material. It is very good value at £9.99. I would recommend this book to pharmacists and to all who have an interest in social history.

Peter G Homan



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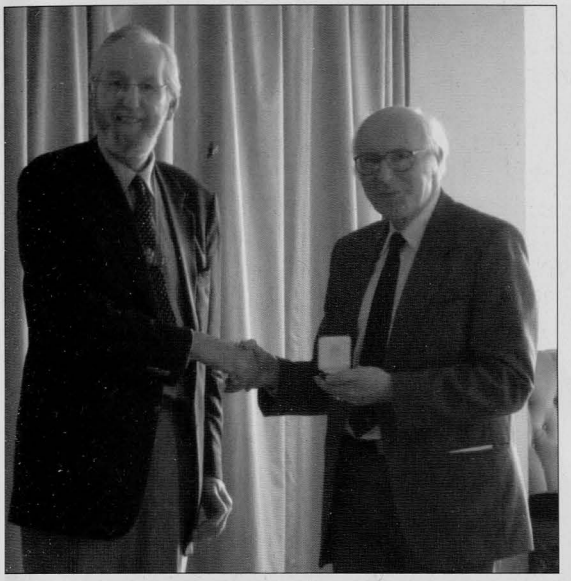
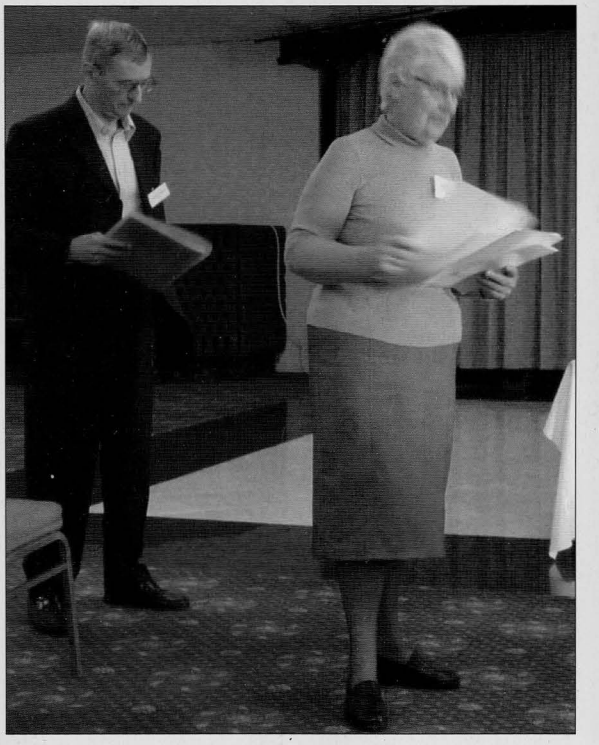
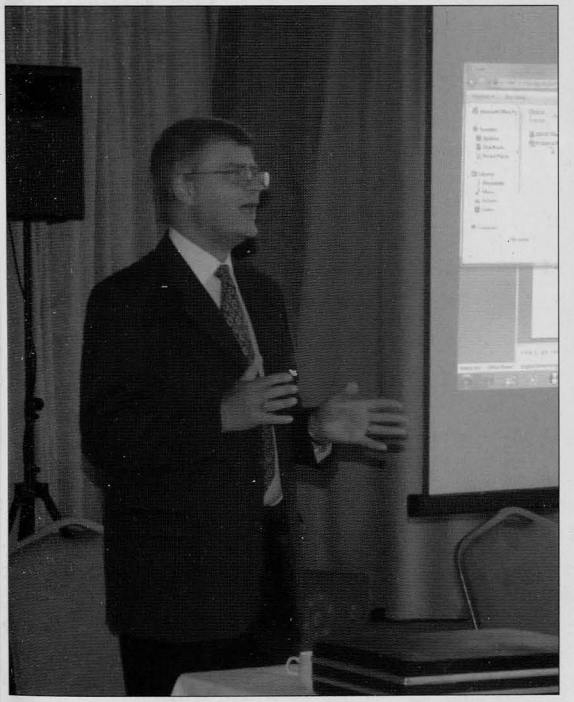


Annual General Meeting 2010, Llanelli

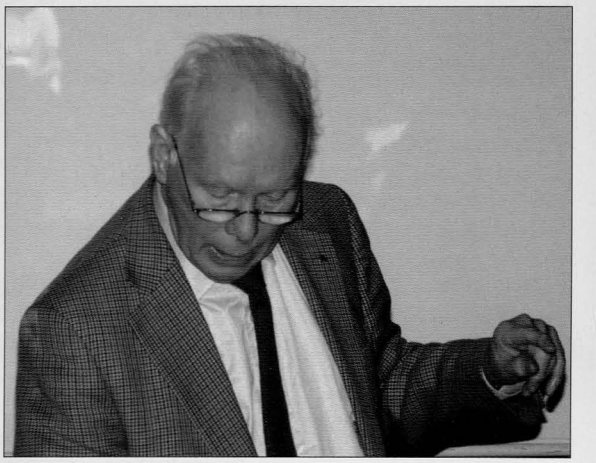
Above: Pharmaceutical Historian editor Ainley Wade receiving the fifth Leslie Matthews Medal from President Roger Mills.





Above: Roy Allcorn chairing a discussion on 'Pharmacy practice as it was at the start of our careers.'

Right from top: Roger Mills and Peter Homan at the AGM; Dr Shirley Ellis, organiser of the Conference, and Renzo Console; Professor Terry Turner speaking at the National Botanic Garden of Wales, Llanarthne, Carmarthenshire.



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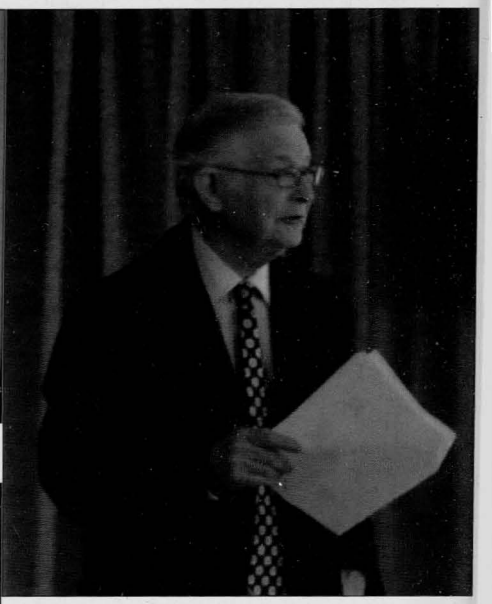
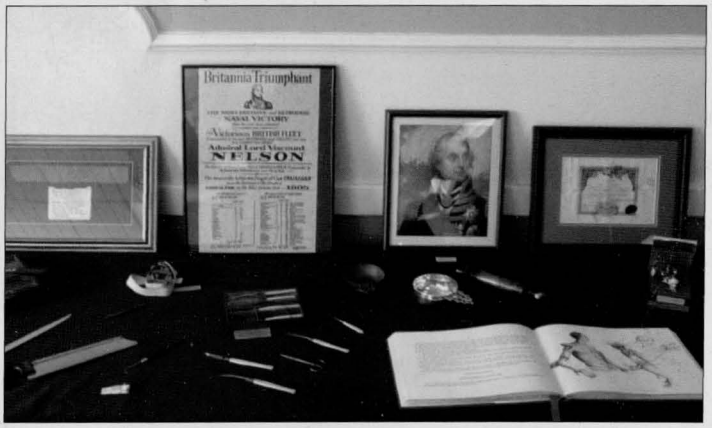


Annual Spring Conference 2010, Llanelli

Left: Dr Mike Crumplin with displays of Nelson memorabilia and his book (*Men of Steel,* 2007) for his presentation on 'Death of an Admiral: Surgery in Nelson's Navy'.



Above: Dr John Crellin presenting 'Pharmaceutical Discoveries and Public Relations: Postcard Images'.

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British Society for the History of Pharmacy

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The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.
BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist.

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Promotion of historical studies related to pharmacy.
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Preservation of pharmaceutical artefacts and historic pharmacies.
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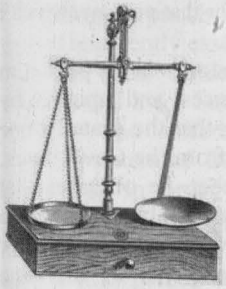

PHARMACEUTICAL HISTORIAN

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840 Melton Road, Thurmaston, LEICESTER LE4 8BN

Contents

Diary

Note earlier starting time for meetings

Wednesday 29 September 2010

'The Making of "The Victorian Pharmacy"' by Professor Nick Barber, School of Pharmacy. 6.00 at Lambeth.

Wednesday 17 November 2010

'Horatio Nelson: his wounds' by Peter Warwick, President of the 1805 Society, 6.00 at Lambeth.

BSHP Spring Conference 1-3 April 2011

The 2011 Conference will be held at the York Pavilion Hotel, Fulford, York. The overall theme for the weekend will be 'Pharmacy as part of Social History.' On Friday evening we hope to have a speaker on the role of museums in teaching social history.

Short papers are invited for the Saturday morning on topics inspired by the recent TV Programme on 'Victorian Pharmacy', or by our Sunday discussions at the 2010 conference [see p 76], or with a Yorkshire flavour. Saturday afternoon will be free for you to enjoy York. The hotel is about 2 miles from the city centre but on a direct bus route. On Sunday, following the AGM, the theme will be 'Quakers and pharmacy' including I hope a contribution from a local historian on the history of 'The Retreat'. No theme for the our in-house after dinner entertainment on Saturday has yet been devised – suggestions welcome.

Offers of papers, and suggestions for Saturday evening, should be sent, with your provisional title, by November 30th, 2010 to Shirley Ellis at 1 Willow Way, Bottisham, Cambridge CB25 9BS or by e-mail to *shirleyellis@shirlellis.plus.com*

Full details of the conference and application forms will be sent out in January.

Obituary

Juanita G L Burnby BPharm, PhD, FRPharmS, FSA

We have learned with regret that our former President and Editor, Nita, died on 3 July 2010. Nita was a founder member of BSHP in 1967, becoming President in 1976 and 1977. She was presented with the Leslie Matthews Medal in 1995 and became an honorary member in 2000.

After qualifying at Leicester Nita worked in hospital and community pharmacy. She obtained a PhD for a classic study in the history of pharmacy with her thesis on the English Apothecary 1660-1760, published as a supplement to *Medical History* in 1983 and has often been quoted since. She published many scholarly papers in the *Pharmaceutical Historian* and other journals between 1970 and 2004 and collaborated with other historians in papers and reviews on apothecaries in the development of advertising, business and the retail trade.

Her collection with Douglas Whittet of the details of many London and provincial apothecaries formed a major input to *Eighteenth Century Medics* (1988) and she also provided articles for the *Oxford Dictionary of National Biography.*

From 1991 to 2000 Nita was the editor of the *Pharmaceutical Historian.* With her husband Matthew she travelled extensively and published many accounts of overseas pharmacies and pharmacy practice.

Nita was also a keen local historian in Enfield and published with the Edmonton Hundred Historical Society. She attended many international congresses on the history of pharmacy and was elected a member of the International Academy for the History of Pharmacy. Sadly, she had suffered from dementia for the last few years. She will be greatly missed by members of the Society and her many overseas correspondents.

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Lapis de Goa : the 'Cordial Stone' - Part Two

Dr Christopher J. Duffin

Continued from *Pharmaceutical Historian* 2010; 40 (2): 22-30.

5. Popular use in England

The Lapis de Goa was freely imported into England and, as with all popular medicines, attracted a significant customs tax. In the mid-eighteenth century, this stood at £29/11/00 for every £100 worth of imported Goa Stones.[1] Such was the interest in the stone that one specimen was exhibited at a Chelsea Coffee House.[2] Furthermore, rather surprisingly for an imported medicine, it featured in a popular song, the meaning of which is now rather obscure:[3]

The jolly, jolly Bowl,
That does quench my thirsty Soul;
When all the mingling Juice is thrown,
Perfum'd with fragrant Goa Stone:
With its wanton Toast too curling,
Curling, curling, curling, curling the Nut-brown Rills,
Which down, down, down, down by the Gills,
Run thro ruby Swallows purling.

Perhaps the fragrance of the stone was the result of the ambergris, musk and rose water used in its manufacture. In a similar vein, Nahum Tate (1652-1715), the Irish poet, lyricist and hymn writer (he wrote 'While Shepherds watched their flocks by night') who was appointed English Poet Laureate in 1692, made reference to the Lapis de Goa in his *Panacea, a poem on Tea*, published in1700:

Rich in Improvements of his well-spent Time,
The Bard returns to his dear Native Clime:
The neighb'ring Shepherds who his Absence mourn'd,
Visit with Joy their wand'ring Friend return'd.
Short salutation past, he feasts their Eyes
With pleasing View of Eastern Rarities.
Nature and Art's choice Gift, the Goa-Stone,
With Plants and Herbs to Western Swains unknown.

One of the earliest references to the Goa Stone is, coincidentally, the most exhaustive in its treatment of the medicine. John Archer, Physician to Charles II (floruit 1660-1684) explains its mode of action as:[4 (p 48)]

> procuring due fermentation and concoction, expelling *(per poros)* in a moist breathing sweat, the vitious humours and enemy of nature, which hinder nature in her actings, and turns to a Scorbute in the blood; it hinders and helps those declinings of strength and feavourish heats in palms of the Hands, or soals of the Feet, which commonly lead people into Consumptions, Hectick Feavers, Hypochondriack, Melancholy, Rheumatisms, and pains that many complain of, and think or fear it may be a worse Distemper; it is a most powerful Antidote against all infection of small Pox, Plague, and other Malignant Feavers, and a very successful Cure in the New Feaver and Ague, whether Tertian, Quartan, or Quotidian, especially if the Stomach is a little cleansed before by a safe Vomiting Pill for that purpose, which I have by me.

He recommends carrying the stones in the pocket in readiness, 'to refresh our senses and spirits, by smelling to them'[4 (p 49)]. Noting that the grated stone could be taken in 'warm Milk from the Cow', Sack, treacle-water, water, wine or beer, he observes that sailors added 'as much powder as will ly on a groat' to the equivalent volume of a bowl of Punch. Archer commends the stone for a long list of diseases, including consumption, ague, small pox, measles, plague, the 'green sickness', pains, gout and bladder stones. Furthermore, he observes that it aids easy breathing, digestion, is good for 'weakness of the back', helps the memory and acts as a preventative for melancholy, gout, dropsy, scurvy, and all infections. Safe to be administered to children, it supposedly prevented and cured 'Consumptions, Rickets, Liver grown, Convulsions, Worms, and other infirmities', as well as being tremendously helpful in the easy cutting of new teeth.[4 (p 53)].

In terms of medicinal use, the Lapis de Goa was highly esteemed, although not necessarily always successful. The 14 physicians who attended Charles II on his deathbed in 1685 utilised the stone as their penultimate effort to save the life of the king. Bleeding, scarification, cupping, blistering, the use of emetics, pills and 57 separate drugs, followed by a cordial containing a further 40 items had all failed over the 8-day period of their application. Their use of the Lapis de Goa and, finally, distillate of human skull also proved unsuccessful.[5]

In terms of the uses of Goa Stone through the eighteenth century, a surprising range of applications can be identified, most of them related to its perceived benefit as an alexipharmic or assisting with fevers. In cases of fever associated with gout, the Bath physician, George Cheyne (1671-1743) recommends sudorifics including the Goa Stone to 'promote a gentle breathing Sweat', especially in older people.[6] It was also esteemed gentle enough for use in childhood fevers in order to 'restrain the Ebullition'.[7] Its highest recommendation came in the treatment of 'malignant' and 'spotted' fevers, such as was typical in cases of the plague, and also in 'pestilential' fevers.[8] Goa Stone was commended to be combined with Gascoign's Powder and taken as a julep (drink) when the worst of such fevers was over, while a similar julep, this time with the added ingredients of Milk Water, black cherry water, Rue water, Tincture of Saffron, Syrup of Gilly Flowers, Alkermes and Contrayerva Stone, was recommended in cases of hot, burning fevers.[9] Sir David Hamilton, physician to Queen Anne during the closing years of her reign, records his use of the Goa Stone in combination with a wide range of other medicines, including Gascoign's Powder, in the treatment of Miliary fever, an infection characterised by the presence of skin eruptions resembling millet seed.[10]

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Drinking a punch into which Goa Stone had been grated apparently eased the problem of muscle spasm, and Sir John Colbatch (1664-1748) was able to recommend it for Small Pox.[11] In the cases of those patients who suffered ill effects from taking the mineral waters of Bath, the use of Goa Stone was prescribed in order to recover 'the Tone of the Stomach'.[12] The supposed strengthening and invigorating properties of the stone could be exploited by taking it as part of a cordial bolus, in which it was combined with powdered crab's claws, saffron and alkermes (a liqueur incorporating the small parasitic insect, *Kermes vermilio*). Alternatively, it could be taken at night in a draught with Milk Water, Peony Water, Syrup of Gilly Flowers, Saffron and Diascordium in order to promote gentle sweating and fulsome rest.[13]

The hand-written English translation of a receipt for the Goa Stone[14] extends the application of the medicine considerably, recommending it in cases of 'inward imposthumes' (abscesses or cysts), quartain agues (a variety of malaria), leprosy, morphew (a skin disease characterised by leprous, scurfy epidermal eruptions) and apoplexy. It was believed to prevent bleeding from the breasts or nostrils, for which it could be taken as snuff. It was also commended as being good for sight, memory, a variety of fluxes, as well as acting as a diuretic and reducing swelling. It is cited as reducing 'Tympanys', a rather obscure term which could be derived from a Middle English word for a symptom of a particular type of dropsy, and may refer to distension of the abdomen by gas. The manuscript also extols its virtues as an alexipharmic against all manner of poisons, including bites from mad dogs and the Goan cobra. It was believed to "comfort all ye members" and be particularly effective in cases of melancholy, whether accompanied by a fever or not.

6. Controversy

The earliest mention of the Goa Stone in English which I have managed to trace is by Gideon Harvey (1636-1702), the somewhat iconoclastic Physician to Charles II and William III. Famous for his witty, increasingly irreverent style, Harvey commented of the Goa Stone in 1686, following a caustic reference to the deceitfulness of the Jesuits, that 'though we know not what it is, or what it will do, we have heard wonders of it'. He had fully made up his mind within the next three years, however, commenting that 'these stupid Fools in Physick are possest of a superstitious Faith of a T-rd' for using 'such like Compounds, beyond the Popish credenda of a rotten worm-eaten Relick'. Later still, he heaped further scorn on the Jesuit 'knavish Makers and Traffickers' of the Goa Stone, which he described as being confected from a 'jumble of *Indian* Ingredients'. Harvey was caustic in his criticism of the lack of quality control: 'whether beneficial or hurtful, whether poisonous or salubrious, whether they are always compounded of the same materials, or now and then some new thing put in; all which none can know'. His most acerbic remarks were reserved for those who prescribed 'these cheating stones':

> Nothing a Physician is more blameable in, than in administring a Medicine, of which he neither knoweth who prepared it, nor what it doth consist of; wherefore they that advise the use of the *Goa-stone* in the Small pox, ought to be censured the worst of Empiricks".

Harvey was not alone in his opinions.[15]

By the late seventeenth century, considerable suspicion was aroused over the efficacy of the central component of the Goa Stone – the bezoars.[16] From his background reading, Frederick Slare, Curator of Experiments in Chemistry for the Royal Society of London, found that most earlier authors were extravagantly enthusiastic about the medicinal qualities of bezoar stones (e.g. Petrus de Albano extolled its virtues 'as if he were delirious'), employing them against plague, leprosy, erysipelas, and 'pestilential sores'. A few accounts were rather more guarded, however, casting suspicion on its effectiveness. Slare therefore conducted a series of experiments on bezoar stones in order to determine their composition and properties. Furthermore, he gathered carefully chosen anecdotal case histories from several correspondents and 'soon found that it did not deserve the great Encomiums which were given to it'. He then extended his investigation to Gascoign's powder, a popular preparation with bezoar stones as an essential ingredient, examining all of the individual components separately (white amber, powdered hartshorn, pearl, crabs eyes or oculi cancrorum, red coral and black tips of crab's claws). His conclusion was that, separately, none of the items 'will scarce be able to give out any Medical Virtue', and that together, 'this admired Drug has the least Title to any Manner of Vertue or Use in Medicine'. Noting that bezoars were, pound for pound, roughly the same price as gold, his conclusion was that 'we exchange good Silver for Clay and Dirt'.[17]

Slightly later, Sir Conrad Sprengell (died 1740) concluded that the use of crab's eyes (oculi cancrorum) or oyster shell would match or even exceed the efficacy of Bezoars, Lapis de Goa or Gascoign's Powder.[18]

A suspicion of contra-indication in the use of Lapis de Goa was raised at the Royal Society of London in 1760. A feverish child recovered successfully when given the Goa Stone, but it 'caused all his cuticula to grow hard like horn and peel off'.[19] This presumably refers to eponychia of the nail beds.

With the passage of time a certain amount of confusion arose over the identity of the Goa Stone.[20] The Indian or Spectacled Cobra, *Naja naja* Linnaeus 1758 is indigenous to Goa. Called 'Cobra di capello' ('Cobra with a hood') in Portuguese, this snake was supposedly the source of the famous 'snake stone'. This was employed as an antidote to poison on the basis of *similia similibus curantur* ('like cures like'). If applied to the wound it was believed to draw the

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poison into itself; the poison was then discharged from the stone by soaking it in milk.[21] Another author describes the snake stone as being artificial, made up of the ashes of various plant roots, and rendered into a paste,[22] whilst another still comments that 'the pièdra de Goa, or pièdra de Malacca, were generally factitious; being composed of bone earth and the concreted bile of some animal'.[23]

Conclusions

The Lapis de Goa or 'Cordial Stone' was an artificial confection invented by the Portuguese Jesuit friar, Gaspar António, in the mid-seventeenth century. The stimulus for the production of the stone was the increasing difficulty of obtaining bezoar stones for the European market. By combining smaller bezoars with comminuted precious stones (emerald, topaz, ruby, jacinth and sapphire), and semi-precious organic gems (pearl and coral), each of which had a long established folklore pedigree, António was able to claim synergistic effectiveness for his fabrication. Musk provided an expensive aromatic component to the medicine, stabilised by ambergris and bound together using hart's horn jelly (later replaced with rose water or various gums). The Lapis de Goa enjoyed considerable popularity and was exported from western India to Europe via Lisbon and other Jesuit outlets. There was also local demand for the stone.

Although a closely guarded secret, the recipe for the Goa Stone is preserved in three manuscript versions at the Jesuit Archive in Rome. By the early eighteenth century, authentic versions of the recipe were being circulated in various pharmacopoeias. Suspicions as to the efficacy of some of the more expensive individual components of the stone led to the development of alternatives, in which a range of calcareous materials were used (such as crab's claws and oyster shells).

Prescribed as an alexipharmic, sudorific, diaphoretic and mild astringent, it was commonly recommended in a wide variety of fevers, including those associated with plague and gout. It was also employed in the treatment of smallpox, measles, fevers in children, and muscle spasm, as well as a cardiac tonic and general cordial or invigorant, in order to raise the spirits. Declining in popularity through the eighteenth century, it was hardly ever used from the 1780s onwards, partly because of the expulsion of the Jesuits from Goa and consequent decline in production. Macau represents the last bastion of its use, with historical specimens supposedly being highly prized and sparingly utilised for intransigent problems even in the late twentieth century. The ultimate accolade of the stone is given by Archer in 1684, who says 'it is a pleasant Companion which I shall scarce go without.'

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Two Tiers Of Materia Medica

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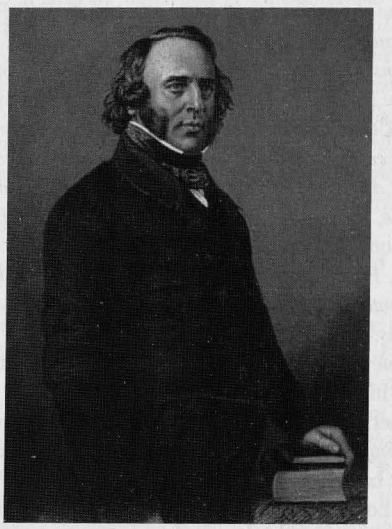
The *Elements of Materia Medica*[1] by Dr Jonathan Pereira was published in 1839. The writer was in his mid-thirties and already well established in academic medicine, teaching both Chemistry and Materia Medica to medical students. His stated aim was to provide medical students with an up-to-date textbook on Materia Medica, and in so doing he imparts a detailed knowledge of his subject as perceived in the early 19th century.



Professor Jonathan Pereira FRS (1804-1853)

He describes Materia Medica, with its alternative name of pharmacology, as a part of therapeutics (the treatment of disease) which is devoted to the consideration of medicines. He then further divides it into three parts '*Pharmacognosia* which treats of simples, or unprepared medicines; *Pharmacy* which teaches the modes of collecting, preparing and preserving medicines; and lastly *Pharmaco-dynamics* which is devoted to the consideration of the effects and uses of medicines'. He continues in the first chapter, which covers 96 pages, to present theories, facts and arguments on aspects of the action and uses of medicines, including their absorption and transmission through the body; the circumstances that could modify their effect; their classification and, finally, a detailed list containing the physiological classes of medicines. However, he has already made it absolutely clear, earlier in the work, that he does not consider that available knowledge of the action and uses of medicines could feasibly allow for their classification by this means, although he appears to accept that, as knowledge advances, such a useful classification could emerge.

A general overview could, therefore, be seen of the studies that a medical student would be expected to

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undertake in Materia Medica, with particular insight into the study of pharmaco-dynamics. However, in attempting to get a similar view of the teaching of the subject to pharmacy students from 1842 onwards, it was immediately apparent that Materia Medica, as taught in the School of Pharmacy, was considerably different from that taught in the medical schools.

To understand this it is necessary to return to the period around the formation of the Pharmaceutical Society, and the professional relationships and politics leading up to it. No attempt will be made to discuss the arguments surrounding the various alliances and disagreements that had existed, but in past encounters with the Apothecaries the Chemists and Druggists had been fortunate in having the general support of the Physicians, although the considerable differences that existed between those two medical bodies could have played a large part in that. The Apothecaries had made two abortive attempts to control pharmacy, the first in 1795 and then again in 1813, resulting on that occasion in the Apothecaries Act of 1815 which, although effectively protecting all of the previous rights of the Chemists and Druggists, did clearly prevent them from encroaching on medical practice. By 1841 the Apothecaries were putting forward yet another bill to secure the control of pharmacy and again it did not succeed.

However, the Apothecaries were expressing considerable concerns regarding Druggists moving beyond the boundary into medicine by offering medical advice and prescribing for patients. Two further issues were of particular importance. The title 'Chemist and Druggist' was not protected and could be used by anyone, and in addition there was no systematic form of education for anyone choosing to use the title, and no form of examination to assess their competence. Even the Physicians were beginning to express their concerns on these points. Unless something was done, pharmacy would ultimately find itself under the control of the medical profession.

Fortunately, in 1841 something was done.

At the Introductory Pharmaceutical Meeting on 11th May 1841 Jacob Bell presented his paper *On the Constitution of the Pharmaceutical Society of Great Britain.*[2] In it he addressed the concerns of the Apothecaries, making it quite clear that any suggestion of hostility or opposition to them was totally unfounded. He suggested that if pharmacy was elevated to the level it held in other countries, and to which it was entitled then

> we shall afford to the Chemist and Druggist an inducement to confine himself as closely as possible within his own province. The more his mind is occupied with the details of the pursuit, on the right exercise of which his respectability would depend, the less likely would he be to interfere with the interests of the Apothecary by giving medical advice.

Thomas Morson in his paper *The Rise and Progress of Pharmacy*[3] given on June 9th also considered that point, but he included the simple statement: 'It is not the wish of Chemists and Druggists, as a body, to become Medical Practitioners'.

This was not a case of inter-professional courtesy; it was a political necessity. The new Society, if it was to be supported by the Physicians, and even recognised by the Apothecaries, had to distance itself, as a body, from any hint of encroachment on medical practice. That was only the first of the points mentioned; there were others of equal importance. However, if it was necessary to control, or change, a particular practice, where better to start than education which was at the heart of the new Society's objectives?

Two physicians invited to speak to the Society had no difficulty in embracing this apparent remit. Dr A T Thomson in his *Introductory Lecture on Materia Medica*[4] on 16th February 1842 rather gently approached the problem. In defining his subject in relation to medicines and the physiological influence of their administration he states

> Now, although the latter part of this definition does not refer to those objects which the Chemist and Druggist desires to become acquainted with, as essential for the practice of his art; yet the knowledge of it will not be uninteresting to him in his investigations respecting the nature of medical agents, even should he never venture to apply it to their administration for the cure of diseases.

Dr Thomson was appointed Lecturer in Medical Botany and Materia Medica at the first AGM on 17th May 1842, giving his first lecture to upward of 40 members on the same day.

Dr Pereira was also invited to speak to the Society on 30th March 1842 and in his lecture on *Modern Discoveries in Materia Medica*[5] he was a little more direct. He considered it advisable to stick to matters relating to the natural history of drugs, and made the point 'Details respecting the effects and uses of medicines, though interesting to the members of my own profession would be out of place here'. The following year Dr Pereira was appointed the first Professor of Materia Medica at the School of Pharmacy.

The situation was finally confirmed in the Pharmaceutical Journal of 1st September 1842 when, under information on *The School of Pharmacy*[6] the following appeared:

> Although our lectures on Materia Medica will include an account of the general properties, effects and doses of remedies, they will not comprehend therapeutics and the practice of medicine, and therefore differ from the lectures on this subject in the medical schools.

Thus was created, specifically for pharmacy students, a second tier of Materia Medica that did not involve pharmaco-dynamics.

Even with this restriction, returning to Jacob Bell's paper on *The Constitution*, it is very apparent that he, and his colleagues, did not intend future pharmacists to simply be skilled dispensers of prescriptions, although it was clearly expected that they should become the experts in all aspects of this area of pharmacy.

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In the two years that followed, the solid foundations for the fulfilment of the aims of the Society were laid; the possibilities of removing the disunity within pharmacy itself and of co-operation with the medical profession; the removal of the stigma of lack of education and examination by the opening of the School of Pharmacy; meetings where scientific papers could be presented and discussed and, finally, the new Chemistry Laboratory which allowed opportunities for discovery and research. Of equal importance, throughout the whole of this time, was the regular publication of the *Pharmaceutical Journal.*

However, the subject under consideration is Materia Medica. How did this and, in particular, Dr Pereira, assist in the aims of the new 'education based' Society to elevate pharmacy to a unique position in the overall field of medicine, based on knowledge, specialisation and expertise? Returning to Dr Pereira's *Modern Discoveries Lecture*, Jacob Bell[7] later indicated that the impact of this lecture on the members present was such that they decided immediately to ask him to become one of the Professors at the new School. However, this was not possible for the first session since three short courses of lectures by Dr Thomson, Mr Fownes (Chemistry) and Mr Redwood (Pharmacy) had already been arranged. In order not to interfere with these arrangements he was asked if he would deliver a few evening lectures on any subject he felt would be interesting and appropriate. It would probably be fair to comment here that such an arrangement was not totally one-sided in only benefiting the Society, since Dr Pereira would have had an effective guarantee that his lectures would be published in the *Pharmaceutical Journal.*

Consequently, he delivered a total of five lectures during the year that followed. The first two *On the Elementary Composition of Foods*[8] he describes as having the object of laying before members of the Pharmaceutical Society some account of recent investigations of Chemists and Physiologists concerning the nutritive qualities of food. Having examined the chemical elements involved, he discussed in detail their known sites (blood, bone etc.), how the body acquired them (in which foods) and how it dealt with them, he reminded his audience, towards the end of the lecture, 'There is, however, much yet to make out on this point. No plausible explanation has hitherto been offered of the necessity of the variation of diet, and the use of succulent vegetables or fruits for the preservation of health and life'.

The other three lectures, the first of which appeared in the *Pharmaceutical Journal* on 1st April 1843, and continued in various parts through a number of issues, was on the *Polarization of Light.* These lectures, although giving an indication of its practical application in distinguishing various oils, were very long, extremely detailed and of considerable complexity, and must have tested the limits of concentration of even his most ardent listeners or readers.

However, it is worthy of note that neither subject was based on the traditional pharmacognosy aspect of Materia Medica. Whether this was as a courtesy to Dr Thomson, or based on the possibility that he wished to seek a wider audience for two subjects of particular interest to himself, is of little consequence. The important point is that, in terms of subjects *interesting and appropriate* to Pharmacists, he had introduced nutrition and its chemistry and also a highly technical subject, with the possibility of its use as a scientific test to distinguish between various substances.

On his appointment as Professor of Materia Medica, Dr Pereira gave *The Introductory Lecture.*[9] He makes the point 'Pharmaco-dynamics requires no teaching in this establishment – it belongs to the Medical Schools', which many present-day pharmacists could assume to be an irritating over-enthusiasm for the restrictions placed upon him. However, it must be remembered that he was a physician teaching in a relatively new organisation that represented the interests of chemists and druggists, and he had to ensure that no criticism could be levelled against him, from any quarter, regarding over-stepping that critical demarcation line that divided his own subject. This particular point raises a very important question. Where did he see that line?

He made it clear that future 'Pharmaceutists' should have knowledge of appropriate doses of medicines and of some cautions respecting their use, and intended that his course would include some details respecting the medical properties of drugs, but that they must necessarily be very brief and entirely practical. He also mentions poisoning as being a very appropriate subject for discussion, not in terms of details of treatment of poisoning, but principally the use of antidotes. He states:

> My object, therefore, will be to show how a case of poisoning ought to be treated, until the assistance of a Surgeon or Physician can be obtained'.

At the very least, pharmacy would take its first educated steps into toxicology. He made a further very important statement:

> Unlike the Pharmaceutists of other countries, the Chemists and Druggists of Great Britain have hitherto been content to carry on their business as a mere trade, without acquiring scientific knowledge. With means at their command of acquiring knowledge, unrivalled by any other nation, they have hitherto allowed Scientific Pharmacy to remain in a very degenerate state.

Anyone hearing or reading his lecture would have been left in no doubt that this situation would not be allowed to prevail, in Materia Medica, under his professorship.

In terms of his knowledge, research and teaching Dr Pereira was already held in extremely high regard in his own profession. In the *Memoir*[10] that was later to be written to his life, Jacob Bell made it very clear that, although always treading very carefully along the line separating pharmacy and medicine, in terms of the natural history, commercial details and chemical

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characters of Materia Medica these were 'dwelt upon at greater length in a manner calculated to make an impression on the memory'. In his subject he had 'a peculiar tact and skill in description and illustration which invested it with a new character'.

It is impossible to list here the full extent of the number of papers he gave as lectures to the Society, or had published in the *Pharmaceutical Journal*, but the range of his knowledge can be seen by mentioning just a few: *Varieties of Hyoscyamus; Grains of Paradise; Potato Starch; Adulteration of Scammony; Some rare kinds of Rhubarb; Notices of several drugs from St Petersburgh; The light and heavy varieties of Carbonated and Calcined Magnesia; Commercial Varieties of Turmeric; Black Balsam of Peru* and many more. He also returned to polarization with *The Circular Polarization of several Terebinthinate Substances* together with some other subjects that may be of particular interest.

In an article and report that appeared in the *Pharmaceutical Journal* of 1st July 1844 he suggested that the Council should establish a Scientific Committee for the advancement of pharmacological knowledge, under the auspices of the Society, to answer the many questions that remained about the natural history and origin of a considerable number of substances used in medicine. He made the point that no other country in the world had so many of the facilities necessary to carry out such inquiries as Great Britain, and suggested that a committee established under the auspices of some influential public body might do much. He believed the Pharmaceutical Society to be the most appropriate institution to undertake this, particularly as one of the Society's purposes, according to its Royal Charter of Incorporation was that of advancing Chemistry and Pharmacy. After a great deal of positive discussion, the Chairman of the meeting, being a Member of Council, pledged himself to introduce the subject at the next council meeting, and Mr Bell also offered his support although a little concerned about the expense, which, however, he felt could be justified in terms of the obligations under the Charter.

A course of lectures *On the Microscopic Vegetations Developed in Pharmaceutical Liquids*[12] again published in the *Journal* starting in the issue of 1st January 1848, gave detailed microscopic descriptions of vegetable filaments found in various liquid preparations and also included yeast, a considerable amount of information on fermentation and a mention of yeast being a vegetable parasite found on man.

In the *Journal* of 1st May 1850 an article *On the Alcohol Test of the Purity of Castor and Croton Oils*[13] gave his arguments, with numerous experimental results, on why he believed that the then usual test for determining purity and freedom from other fixed oils to be 'a very fallacious one'.

Finally, a fascinating report appeared in the Journal of 1st Jan 1852 *On a Remarkable Specimen of Decomposed Chloroform.*[14] He had been asked, by an apothecary in Belfast, if he would look at a sample of chloroform which had some rather strange qualities. Although its container had its stopper 'fast-in' it had periodically, over a number of months, changed from totally colourless to pale pink, to dark pink and back to colourless. Dr Pereira describes his own observations of this cycle, together with the chemical and microscopic analyses he performed on the substance, but unfortunately, on this occasion, he was unable to arrive at a definite conclusion as to its cause.

Mention should also be made of the donation of some 500 specimens, from his own collection, which was of such importance in the formation of the Museum of the Pharmaceutical Society.

Materia Medica, in its new 'pharmaceutical form', with all of its associated problems, was still the vital link between pharmacy and the practice of medicine. In considering the subject, it has been necessary to touch upon the life of a man esteemed in both professions, and it would be easy to forget, having devoted so much of his time to pharmacy in this country over what unfortunately proved to be the last eleven years of his life, that he had many other professional commitments. Among these, at the time of his death in January 1853, were his positions as Examiner in Materia Medica and Pharmacy to the University of London, Physician to the London Hospital and his responsibilities to the patients of his own medical practice.

Dr Pereira, his colleagues at the School of Pharmacy, the Founder Members of the Society and many more who have followed over the years deserve to be remembered and recognised for their dedication to one purpose. To use the words of Jacob Bell 'the advancement of the art and science of pharmacy'.

This paper was presented at the BSHP Annual Spring Conference, Llanelli, March 2010.

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2. *Pharmaceutical Journal* 1841-42; 1: 4-13.
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Has pharmacy adequately promoted pharmaceutical discoveries to the public?

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A quip on a 1930s postcard reads: "Medical Science says: Whisky can't cure a common cold! Well neither can Medical Science!" (**Fig. 1**) Yet any public scepticism of 'medical science' during the 1900s did not stop the medical profession effectively deploying medical science as part of its public relations (PR).

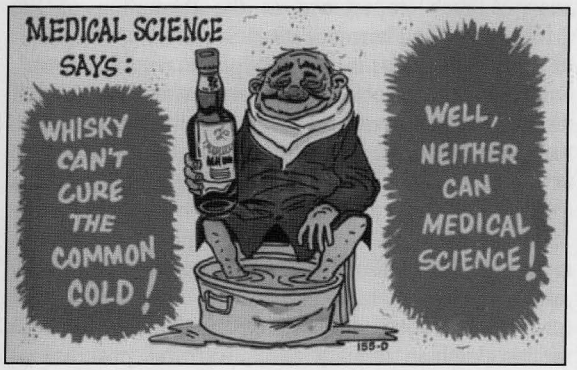

Figure 1

This presentation, intended to provoke discussion, asks whether the profession of pharmacy in Britain and America, through its schools, professional organisations and museums, adequately utilised PR to foster public appreciation of the scientific basis of pharmacy? Related to this are two other questions. Has the pharmaceutical industry been left to garner most of the credit for drug discoveries – credit that failed to reach pharmacy as a whole? And, does a pattern exist in the history of pharmacy's public relations that is relevant to current concerns over the place of science and academic pharmacy in Britain's new professional body?[1]

Why turn to picture postcards for responding to the questions? In part, it is because I enjoy showing their value as twentieth-century historical documents that add to the written record and prompt questions about constancy and change in attitudes toward health care. For this presentation, leaving aside the thousands of cards offering views or caricatures of retail pharmacy, I comment on how the profession has portrayed itself on cards. Admittedly, compared with advertising, media reports and company records, cards are a limited resource for examining public relations; nevertheless, sufficient numbers survive to allow pertinent comment.

A premise behind my remarks is that countless discoveries/new concepts have failed to thrive or receive due credit.[2] Many reasons account for this, but consideration has to be given to a researcher's lack of an association with a world-class institution or with a network of disciples and supporters; even publication in a minor journal can be a disadvantage. If such factors contributed to many past pharmaceutical investigations being forgotten, the situation has been changing in recent years as virtually all academic institutions started to promote intensively, through websites and other media, their scientific research, both in general terms or with specific results.

Pharmacy schools and headquarters buildings

The PR of pharmacy schools has rarely been conspicuous on postcards, at least compared with medical schools. The latter, especially in the U.S., have long used postcards with promotional messages on the backs.[3] For instance, a 1930s card showing the imposing building of St. Louis University Medical and Dental Schools:

> Students from virtually every State of the Union, as well as many foreign countries, attend these schools, which are among the oldest and most outstanding institutions of their kind in the country. *Both are known at home and abroad for their extensive medical research.* (Italics added.)

In 2009, however, the School of Pharmacy, University of London, published a striking series of ten cards titled 'The science of medicines – images from The School of Pharmacy'; a 'thank you' was added for 'helping to support our research.' The cards are all scanning electron microscope images of, for example: (i) cannabis resin, captioned 'Cannabis, a controlled substance in the UK since 1928. The earliest medicinal use was in China in 2737 BC. It is used experimentally to treat chronic pain'; (ii) 'liver cells showing ballooning which is typical of apoptosis or cell suicide' (**Fig. 2**); and (iii) 'carbon nanotubes are 50,000 times smaller than a human hair but one of the strongest materials known to man and capable of carrying medicines'.[4]

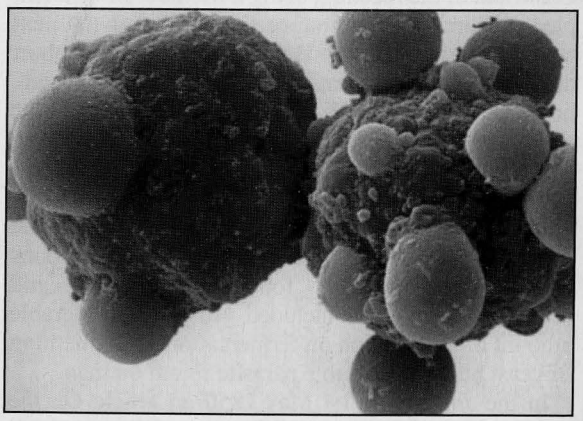

Figure 2.

Even though these cards may be viewed more as a modern art form (at least a meeting of art and science), rather than illuminating the nature of research – for instance, there is not even an explanation of the role of the scanning electron microscope – cards are unusual in drawing attention to the science behind drug

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discovery or development. They contrast with those from the organisations of pharmacy that invariably show headquarters buildings, which, while hinting at the stability and authority of the profession, reflect the past rather than the future. Of course, many people hardly notice such buildings, especially when they are just one among many other notable neighbouring buildings, as was the case with the former Bloomsbury Square headquarters of the Pharmaceutical Society of Great Britain (PSGB, **Fig. 3**). Moreover, those of us who spent time there might agree that, even when it housed the School of Pharmacy until around 1956, no obvious hint of modern science or even patient care caught the eye of passers-by, or even if they made enquiries at the front office.[5]

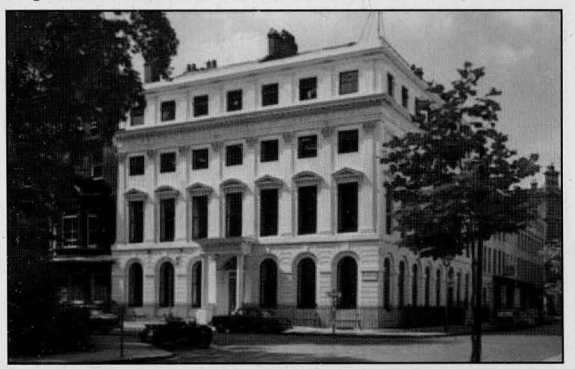

Figure 3.

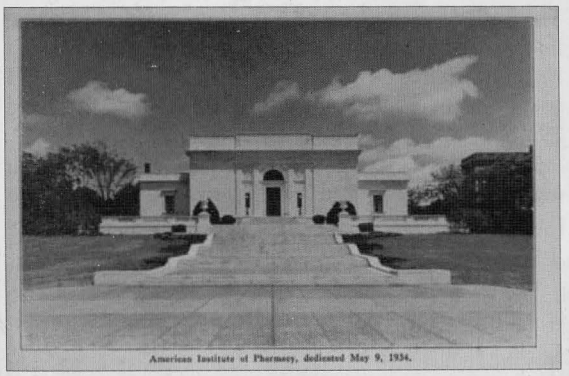

Figure 4.

In contrast to the PSGB, it was easier for visiting members of the public to recognise a feeling for science at the American Institute of Pharmacy Building in Washington (headquarters of the American Pharmaceutical Association). A handsome building, dedicated in 1934, with a key position as the only non-governmental building on Constitution Avenue (**Fig. 4**), a plaque on the front is inscribed:

> Dedicated to those who contributed their knowledge and endeavour to the preservation of public health and the advancement of science in pharmacy.[6] Additionally, two bas-relief panels in the building (shown on early postcards) symbolised the advancement of pharmacy. The caption on one – a reminder of pioneers – stated: 'the youth depicts the progressive step, the senior represents the pioneer, observing the improvements made as fruits of his earlier researches." (**Fig. 5**)

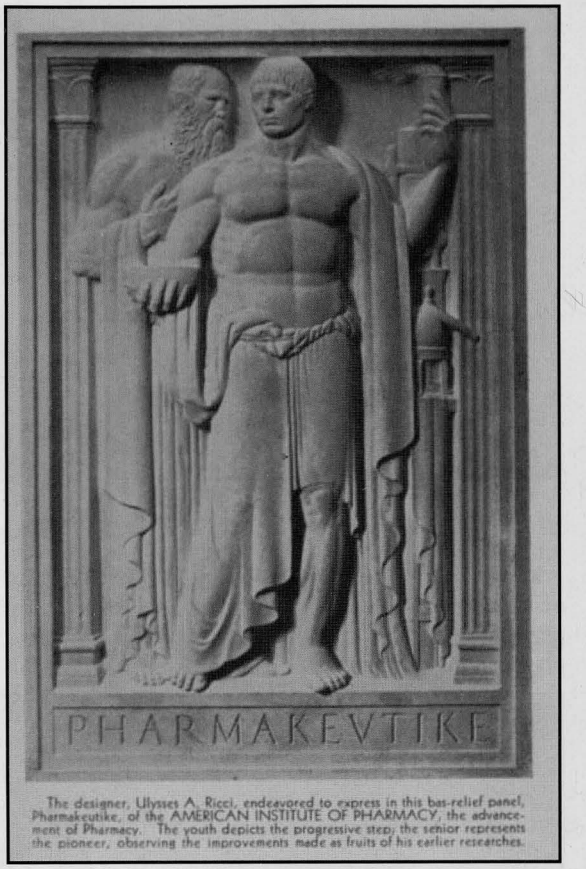

Figure 5.

Museums and history

If cards from organisations have done relatively little to indicate the scientific underpinnings of pharmacy, those from pharmacy museums are equally disappointing.

Although there are portraits of pharmaceutical scientists – often made available at history of pharmacy confer-ences – they rarely have captions that provide context. Thus they can generally be seen as triumphalist history, rather than illuminating the nature of relevant research and its importance. There are also postcard reproductions of nineteenth-century and earlier laboratories, some with associations to retail/wholesale pharmacy (e.g., **Fig. 6** for the 1898 laboratory of John Bell & Co.), but these cards offer little understanding of how laboratory observations could improve the quality of medicines. Moreover, without context, any sense of the value of laboratory science for pharmacy is diluted, at least for popular consumption, since to the untutored eye such cards are little different from other 'laboratory' cards depicting 'alchemy', for example, popular cards from the Science Museum, that tended to encourage popular ideas of pre-science or magical transformations (**Fig. 7**, c. 1930).

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Figure 6.

Museum cards, in mostly focusing on the retail side of pharmacy, commonly highlight old or historic pharmacies and antiques; for instance, attractive photographs (published 1981) from the American

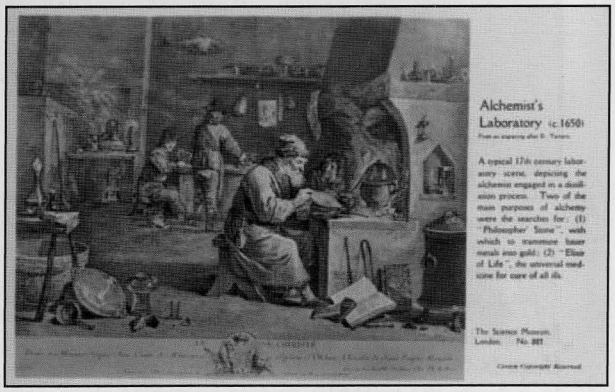

Figure 7.

Institute of the History of Pharmacy showing, mortars, pill machines, shelf-ware and show globes. Although some context is provided in an accompanying booklet, relatively little of this information is included on the cards to indicate how the artifacts fit with the practice of pharmacy *and* science.

Even when 'museum' cards – many perhaps best described as 'nostalgia' cards – provide some sense of pharmaceutical context, the captions and suppl-ementary information rarely notice scientific or social background. For instance, a card (c. 2000) from the Royal Pharmaceutical Society is captioned: "'The Pharmacist in retail practice' with his wife and son acting as customers. Posed for the Society's photographer in 1959" (**Fig. 8**). This is an enigmatic caption, however, not only because a purchaser of the card might wonder whether the pharmacist and his wife are, in fact, grandparents of the infant in a push chair, but also since an opportunity is lost to comment on change in retail pharmacy, even about the redundant sign 'Laboratory' above the clock.

The pharmaceutical industry

One group of pharmacy PR cards that offer some appreciation of the role of science in drug discovery are from the pharmaceutical industry, although, admittedly, this role is not always apparent amid the commercial promotion of products. The cards fall mainly fall into two groups. One covers those sent to doctors (and sometimes pharmacists) that indicate research behind a particular product. The second group are those that were generally given away free, often to visitors (the public as well as health professionals) when on a factory visit. Among the first group are product advertisements that range from, for instance, the Squibb Company 'Therapy Briefs' that noted the latest research to support a product (for example, Brief #18, circulated 1951, for Rubrafolin) to examples of one of the most intensive postcard marketing campaigns during the second half of the century, namely for Abbott Laboratories' Pentothal, an intravenous anaesthetic. From 1954 to 1968 the company mailed to physicians (occasionally to nurse anesthetists and others), from locations around the world, over-sized view cards of cities, local markets, natural wonders and other sights. The back of each card had a message, printed in script, that without specifically referring to research emphasised such characteristics as safety, dependability, and ease of use, even aboard the Queen Elizabeth II (**Fig. 9**, mailed 1959).[7]

The second group of cards – free cards from companies – emerged in America (not just from pharmaceutical companies) in the early decades of the

Figure 8.

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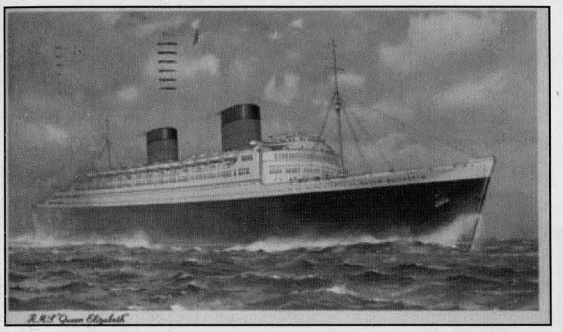

Figure 9.

century.[8] Throughout much of the century, they invariably featured views of factories and selected manufacturing processes or amenities, sometimes

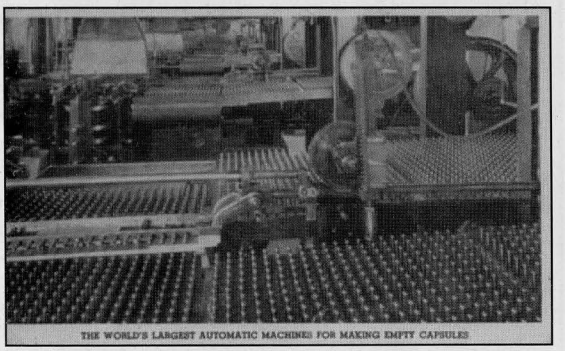

Figure 10.

making the role of science clear. Examples ranged from early views of the 'Biological Laboratories of H. K. Mulford ('where vaccines, Antitoxins, Bacterins, and Tuberculins are Prepared')' to 1950s cards of the 'Biological Production [at] Parke Davis & Company', a company, it was stated, that 'pioneered in research and production of antibiotics, antitoxins, vaccines and related biologic agents.' Fig. 10, for a 1940 Parke, Davis card, shows 'The world's largest automatic machines for making empty capsules' on which the sender, a pharmacist, wrote: 'Visited P.D.&Co. yesterday & it is one of the highlights of our trip.'

Summary comments

In summary, twentieth-century British and American cards published by the organisations of pharmacy – albeit a limited window into public relations – suggest that relatively little attention was given to offering the public an understanding of the science basis of pharmacy or the nature of pharmacy research. On the other hand, clear hints of this came from industry despite being diluted, some might say tainted, with overt commercialism. Thus it is suggested that the public came to associate industry with pharmacy research, a suggestion that needs to be examined in the light of other approaches to PR.

It is, of course, not surprising that PR from pharmacy's professional bodies has focused largely on community practice. However, it is reasonable to ask, What is the cost in terms of professional image when opportunities to promote an understanding of the science of pharmacy are given little attention? Indeed, it seems to me that it was soon forgotten that an emphasis placed on the science base of pharmacy was very much behind the successful efforts in establishing the Pharmaceutical Society and a professional image for pharmacy. I suggest, too, that the pattern of limited science PR contributes, unconsciously, to current concerns over the place of scientists in the new professional society. As is well known, interminable debate exists over what the public sees as 'professional.' Even so, I think few would disagree that an image of science can be more than helpful. Maybe, in the current upheaval for British pharmacy, there is a case for the publication of free cards analogous to those recently produced by the School of Pharmacy, although only so long as they indicate, by way of context, both the science and humanity demanded for pharmacy practice.

Based on a presentation delivered to the BSHP annual meeting, Llanelli, March 2010.

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1. To notice one voice, Munden RP (letter to editor). Why should I consider joining? *Pharmaceutical Journal* 2010; 284: 49

2. One has only to look at countless patents, now easier to research, at least American ones: Google Patents *www.google.com/patents* For introduction to the riches of these for pharmacy history, see Higby G. Lost in the Patent Office: A Whimsical Journey through Pharmaceutical Patents. *Pharmacy in History* 2009; 51: 139-140; 183-184.

3. It should be added that early cards of pharmacy schools in English-language countries are not easy to find, though pharmacy may be mentioned as part of the activities of a university as on one showing 'Whitney Hall, The University of Connecticut, Storrs (CT)' The description on the back of the card reads: 'A land-grant State University founded in 1881. Offerings in Agriculture, Arts and Science, Business Administration, Education, Engineering, Home Economics, Insurance, Law, Nursing, Pharmacy, Physical Education, Physical Therapy, Social Work and pre-professional programs in medicine, dentistry and veterinary science. Graduate study in many fields.'

4. Cards available from Development Office, School of Pharmacy, University of London, 29-39 Brunswick Square, London, WC1N 1AX.

5' Visitors could glimpse museum cases, but exhibits in the 1950s included seventeenth and eighteenth-century materia medica.

6. For background to the building, Griffenhagen G. History of the American Institute of Pharmacy. *Pharmacy in History* 2002; 44: 47-63.

7. For overview and many illustrations, Lai DC. *Pentothal Postcards.* West New York: Mark Batty, 2005.

8. See Littman W. The Production of Goodwill: The Origins and Development of the Factory Tour in America. *Perspectives in Vernacular Architecture* 2003;9:71-94.

https://doi.org/10.24355/dbbs.084-201803121421

Review

History of Pharmacy in India and Related Aspects Volume 7: Builders and Awareness Creators of Modern Pharmacy 4: Sir Ram Nath Chopra: Work, Vision and Legacy
Prof Harkishan Singh

Delhi, India: Vallabh Prakashan, 2010, pp.266 (hardback price £20.00).

This is the seventh book in Harkishan Singh's series exploring the history of pharmacy in India. This time, however, very little is by Singh himself; the book consists mainly of the writings of Ram Nath Chopra. Although a doctor, Chopra was the key figure in shaping Indian pharmacy from the early 1930s until independence. He has also been described as 'the father of pharmacology in India'; he was a pioneer of systematic studies of indigenous drugs, and he was an active promoter of Indian systems of medicine.

The opening chapter is a brief biography of Chopra by Singh. This is a much condensed version of the account of Chopra's life that appears in volume 6 of his series. Chopra was born in the Punjab in 1882. After secondary education in Lahore he left for England in 1903, completing a BA in Natural Sciences at Cambridge in 1905, followed by a medical degree. He entered the Indian Medical Service in 1908, and in 1921 he joined the staff of the Calcutta School of Tropical Medicine as its first professor of pharmacology. He died in 1973.

It was as chairman of the Drugs Enquiry Committee in 1930-31 that he made his mark on Indian pharmacy. Like those who framed pharmacy and poisons legislation in Britain, the committee had a dual role. It was established to 'enquire into the extent to which drugs and chemicals of impure quality or defective strength, particularly those recognised by the BP, are imported, manufactured or sold in British India, and the necessity, in the public interest, of controlling these; and to enquire into the necessity of legislation to restrict the profession of pharmacy to duly qualified persons, and to make recommendations.' The recommendations of this committee shaped pharmacy in India over the following decades.

The twelve chapters that form the body of the book are largely presidential addresses given by Chopra, although there are also a small number of his scientific papers. His topics are wide-ranging; from Rauwolfia and drug manufacturing, to drug addiction and public health. There are three appendices, two of which are previously published reviews of Chopra's contribution to the growth of pharmacology in India (1942) and to the development of pharmacy in India (1973). Both were written by one of Chopra's protégés, Bishnupada Mukerji, who was himself profiled in Singh's sixth book. The third appendix is a list of Chopra's publications.

Chopra's comments on the state of pharmacy in India represent an important contribution to the history of pharmacy because of their incisive and objective nature. His 1934 presidential address to the All-Bengal Compounders Association, for example, provides a first hand account of the findings of the Drugs Enquiry Committee. He states that 'it is painful for me to say that there is no organised and self-contained profession of pharmacy in this country' and he proceeds to identify the key reasons for this and the actions that need to be taken to address them.

His entreaties to the profession to prepare for change are a model of leadership. 'Time, hard work and patience are needed,' he declares. 'It is possible that in the beginning some of you may feel the contemplated changes to be a hardship.' There are lessons here that today's leaders might do well to emulate.

For historians of pharmacy the book brings together a number of important and significant contributions by someone who was at the very centre of the action in the early 1930s, and who offers insights on the state of pharmacy in India right up to the 1960s. But also of interest are his analysis of the pharmaceutical industry, and research on indigenous medicinal plants. The value of the book is to bring the personal reflections of a leading figure who was intimately engaged with the state of pharmacy in India to the attention of pharmaceutical historians.

Both Chopra and Mukerji have an appealing and fluent writing style which makes the book an easy and enjoyable read. The presidential addresses, being mainly observations and reflections, rarely include references to other sources, although these are given for his scientific papers. Singh's contribution on this occasion is to make these observations available to a wider audience, and to retrieve them from historical obscurity.

Stuart Anderson

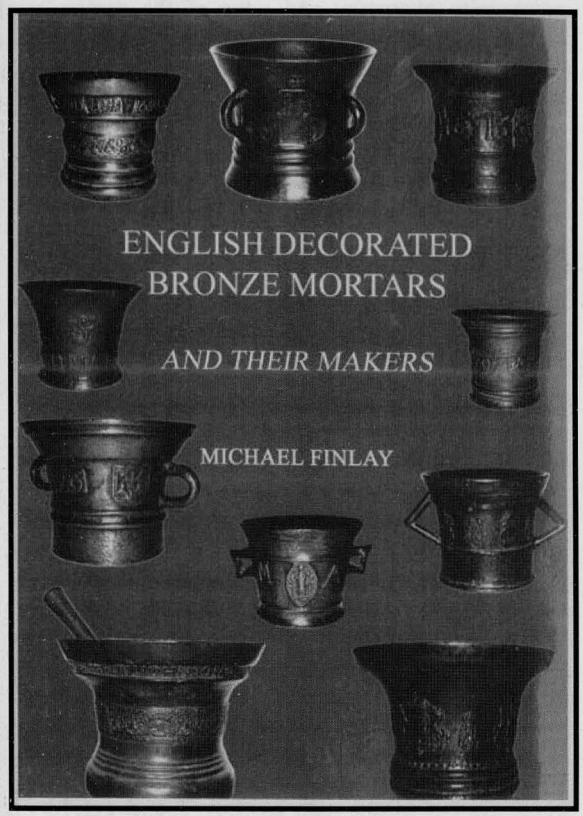
https://doi.org/10.24355/dbbs.084-201803121421

Review

English Decorated Bronze Mortars and their Makers

Michael Finlay

Carlisle: Plains Books, 2010, pp 256, ISBN 9781872477022, Price £50.00.



Until now, information about English bronze mortars has been scattered amongst many sources, often highly specialised and difficult to locate. When Michael Finlay began collecting mortars in 1992, he began a journey of research which continued after he disposed of his collection in 2004, covering the Victorian and early 20th century writers through to the most recent studies identifying founders' scratch marks. He has traced mortars in museum holdings and private collections which appeared in the auction rooms in the last few years. *English Decorated Bronze Mortars and their Make*rs is the highly informative result.

The work is divided into discussions on medieval mortars, mortars and their founders by counties, London foundries, unidentified mortars and founders, and lost mortars. There is a checklist of 310 dated mortars, sketches of figures and devices, and an extensive bibliography. The main body of the book is devoted to mortars and their founders in 26 English counties and London. Most seem to have been cast by bellfounders, who used the same identifying stamps on both bells and mortars. However, there were many connections between foundries: Mr Finlay gives several instances where stamps were passed down from father to son, or moved some distance to unrelated foundries. He lists some founders who are known as mortar makers only from the record of their stock in trade, no surviving examples having yet been discovered. The text is illustrated. with 321 black and white photographs of mortars, using a standard format, regardless of actual size, plus 8 colour plates.

Occasionally, archive photographs have been used when a mortar can no longer be traced. Mortars are notoriously difficult to photograph, and Mr Finlay provides 278 sketches of figures and devices to aid in the interpretation of often rubbed or poor castings.

Some founders are represented by only one or two mortars. Others were more prolific. Mr Finlay lists more than fifty mortars by Edward Neale of Burford. Other foundries, such as the 'Unidentified London', 'Foundry X' and the 'Cut-card' foundry, produced significant numbers of mortars in particular styles, but have still to be identified. The scratch marks of several founders have recently been identified, including those of the Sturton family in Somerset, makers of copper alloy cooking vessels and mortars.

There may be reservations concerning the attributions of two or three problematic mortars, as Mr. Finlay acknowledges, providing detailed references to sources in support of his conclusions. He considers this book to be a record of work in progress. There are more mortars in private hands waiting to be discovered. Any mortar enthusiast hopes to find that missing link, a mortar which establishes the name of the unknown founder.

All collectors will find *English Decorated Bronze Mortars and their Founders* an invaluable guide to identifying English bronze mortars. Mr Finlay is to be congratulated on an important contribution to the subject.

D Ann Hutton

The book is available at a discount from the author at Matty Beck Cottage, Church Lane, Thursby, Carlisle CA5 6PF for £40.00 including post and packing.

Plate 301: Cuerdon, 1675

https://doi.org/10.24355/dbbs.084-201803121421

Pharmacy Fifty Years Ago

Dr Shirley Ellis
Cambridge

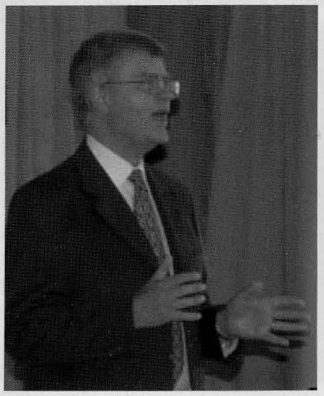
Stimulated by the fundamental changes taking place in the pharmaceutical profession the British Society for the History of Pharmacy devoted one of its conference sessions at Llanelli in 2010 to a discussion amongst members of their recollections of their first year at work. Reports came from all branches of the profession, with the years described lying between 1951 and 1967 and respondents having an average of 50 years on the Register. What follows is a summary of their contributions and I would like to thank all those who took part.

General points

Some factors were common to all respondents, especially the effect of the change which was going on at the time from the apothecary weights and measures to the metric system. The *British Pharmacopoeia 1958* was the last to express dosages in grains/minims as well as milligrams/millilitres. Identification of medicines or ingredients was frowned upon and labels bore only '*The Tablets*' or '*The Mixture*' followed by instructions for use.. Liquid medicines were still common and prescribed in 'spoonfuls'. Bottles were sealed with a cork and wrapped in white demy paper before issue to the patient. Tablets were supplied in cardboard cartons or skillets although glass bottles were being introduced by hospital outpatient departments. Dispensing was from bulk stocks of both common liquid preparations and solid dosage forms, with the counting triangle an essential piece of dispensary equipment.

Training

Qualification was by the Society's Pharmaceutical Chemist Diploma (PhC) or by degree (BPharm or BSc Pharm) with some graduates having to sit the Pharmaceutical Society's forensic examination during their preregistration year, depending upon the University syllabus followed. Practical training could be undertaken as 2 years before college or 1 year afterwards. The two large multiple chains had their own training schemes to assist pre-college students. Boots provided a distance learning package from Nottingham and Timothy White & Taylors had a system which involved an examination. Successful students were offered bursaries towards their college fees. Hospitals rarely took pre-college trainees.



Roy Allcorn chairing the discussion session

The undergraduate pharmaceutics course was devoted almost entirely to extemporaneous dispensing of all types of medicines and was assessed by a 3-hour examination during which technique and presentation were judged. The preparation of injections was probably rarely used after graduation by those in community pharmacy and none of the respondents remembered ever having to make pills in the real world.

One aspect common to all branches of the profession during their pre-registration training was the requirement to dust the shelves in the dispensary. This was seen as a way of students familiarising themselves with the names, official and trade, the appearance and odour, and in some cases the cost of the stock. Many of the galenicals in use still had their Latin names, and are still remembered 50 years later. Students were encouraged to use the reference books available to establish the use and dosage when time permitted.

Community Pharmacy

It is probably better described by the older name of Retail Pharmacy at this time, because viability depended upon the sales of medicines as much as dispensing, and customer satisfaction was of prime importance to establish customer loyalty, especially in urban areas.

Life in retail differed markedly between the multiples and independent pharmacies. Chains had their own corporate image which extended from the external and internal appearance to their methods of working within the shop. Tills were strategically placed and each member of staff was assigned to one till. All sale items were priced including those in the window. Boots refused to sell contraceptives or condoms but offers such as 'buy 3 and get 1d. in 1shilling off' could be found on such things as bottles of 500 aspirin tablets or chlorodyne mixture.

The appearance of independent pharmacies on the other hand reflected the individuality of the owner, its location and the population it served. Small premises had a distinctive odour which was a mixture of the galenicals used in extemporaneous dispensing and soaps and perfumes from the shop.

Customers must have had considerable patience, as many prescriptions for liquid or topical preparations had to be prepared from scratch; perhaps the longer it took the better the patient regarded it. Thrift was a virtue to both pharmacist and patient and empties were accepted for re-filling or washing and re-use, particularly for such products as distilled water or methylated spirits. The presence of a still on the premises and the storage of methylated spirits in bulk necessitated regular visits from the Customs & Excise inspector to ensure no cross-over of activity.

Customers in rural areas still presented requests for 'family recipes', often on crumpled pieces of paper, for both themselves and their animals. Pharmacists were a source of advice, not only on minor ailments but also on the interpretation of documents and

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general problems, because of their standing in the community.

NHS prescriptions were priced at 1shilling per form (later 1 shilling per item) and had to be sorted for submission to the pricing bureau into those under or over 7s./=. Most dispensers and pharmacists could do this without reference to a price list but the skill took time to learn. Luckily the price of both dispensed and sales items remained stable over relatively long periods.

Hospital Pharmacy

The bureaucracy associated with dispensing was not very different in hospital pharmacy from that in retail. Prescription charges were paid in stamps obtained from a machine in the outpatient waiting area because pharmacy staff were not allowed to handle money; dispensed items, for both out and in-patients, were costed and results sent to the administration for budgeting purposes. Patients often had to wait for outpatient prescriptions which had to be made extemporaneously, especially in 'skin clinics'. Consultants frequently varied the amount of coal tar or dithranol to be incorporated into Lassar's Paste according to the patient's response.

Mixtures, lotions, ointments etc. were made in bulk wherever possible using catering size mixing equipment and packed either in containers ready to issue or in 1kg or 2L containers for dispensing later. A few hospitals made tablets using a single punch machine according to local formulae.

Most departments also prepared antiseptics and disinfectants such as Eusol and Lysol, Spirit Soap, Glycerin & Thymol mouthwash, hand lotion and, in some cases, denture cleaning powder, for ward use.

Sterile production was on a small scale but with a wide variety of products. Intravenous fluids were prepared in glass containers with rubber bungs which frequently shed particles on autoclaving leading to a high reject rate when examined against the light. Autoclaves varied in size but all had steam jackets with a prolonged heating up and cooling time that made the whole process much longer than the 30 minute sterilisation time, and the department uncomfortably hot. Ampoules had a higher pass rate but it was dependent upon the sealing skill of the operator, which was of great importance when controlled drugs were being prepared. Sealing was tested by immersing in methylene blue solution under vacuum so that the dye was sucked in through poor seals before autoclaving. Ampoules then had to be cooled and dried before applying a paper label. Eye drops were sterilised by steaming in 100-mL containers and then transferred to sterile dropper bottles on dispensing.

Aseptic preparation was carried out in Perspex glove boxes which were swabbed with alcoholic chlorhexidine solution prior to use. The sterility of the environment within the cabinet was checked periodically by exposing plates of growth media within it. Results showing contamination were surprisingly low. Two preparations which were unpopular amongst staff were the reconstitution of multi-dose penicillin injections and the preparation of bismuth iodoform paraffin paste (BIPP) gauze as the unpleasant smell persisted on one's hands for many hours. BIPP gauze was an early example of recycling as once spread the ribbon gauze was wound around old, washed and sterilised insulin vials, before being placed in sterile glass jars.

Some hospitals still kept leeches which had to be cleaned out regularly, usually by the student. They were rarely used but they were effective in reducing the pressure of glaucoma so that surgery could be performed.

Security was low with ward supplies being distributed by porters in open wicker-work baskets and nurses carrying bottles on trays during medicine rounds. There was little contact between pharmacy and ward staff except when nurses visited the pharmacy to collect discharge medications or the pharmacist made a rare visit to the ward to check the stock cupboards and remove discontinued items issued for an individual patient or out of date medicines.

Pharmacists in Industry

Although many mixtures and ointments were still prepared extemporaneously in the pharmacy most solid dose forms were purchased from the pharmaceutical industry. The range of products available on the NHS was not high, the BNF for the period containing only 175 tablets and capsules. In the same edition there are only 10 antibiotic preparations listed.

Pharmacists working for the larger manufacturers such as British Drug Houses or May and Baker were mostly employed in formulation or quality assurance departments with a few in analytical laboratories.

Except in the companies with large portfolios the latter two tasks could be routine and were often carried out by other scientists who were paid less. Trouble-shooting of batches that had failed which might involve criticism of purchasing of raw ingredients was a job for the professional.

Health and Safety of staff was not always a high priority during the formulation of new products and examples exist of the activity of the product being detected by unusual effects on the operators before they were informed of the product under investigation.

Conclusion

The difference between practice 50 years ago and today is almost unbelievable. It has moved from work requiring practical compounding skills and the ability to communicate health advice to relatively uninformed customers to a need for in-depth knowledge of a wide range of pharmaceuticals and an ability to advise other professionals on their safe use. When we started out 50 years ago we thought that metrication was a significant change but could not foresee that we were at the beginning of a therapeutic explosion and the development of an informed public which would require a totally different approach towards our professional role.

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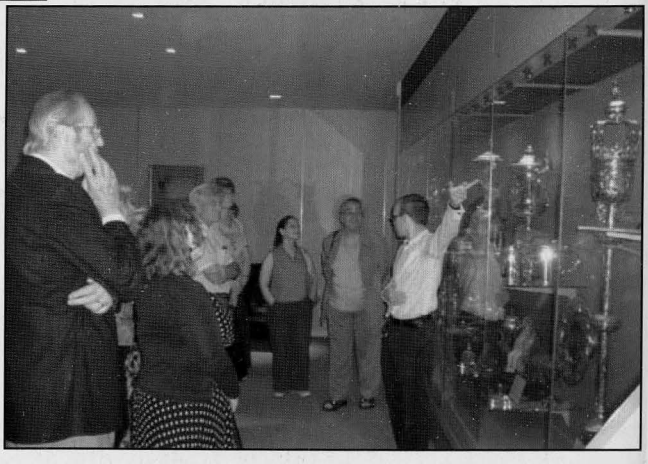

Visit to the Royal College of Physicians Museum and Garden June 2010
Above and top, left and right: Dr Henry Oakeley (Garden Fellow RCP), showing BSHP members round the garden.
Below right: Peter Basham (Museum Curator) with the collection of plate and ceremonial items.

Pharmaceutical Historian Back Issues

Complete volumes of four issues: Volume 36 (2006); Volume 37 (2007); Volume 38 (2008); Volume 39 (2009). Each volume available for £8 UK or £10 Overseas (including post and packing)
The Indexes for 1967 to 1995, 1996 to 2000 and 2001 to 2005 can now be viewed free of charge on the website: www.bshp.org under Publications.
Orders to: Peter Homan, 3 The Ridings, Epsom, Surrey, KT18 5JQ Tel: (+44) (0)1372-723001
Email: peter.homan@lineone.net Cheques, Banker's Orders, etc. to be made payable to the British Society for the History of Pharmacy. Payment can only be accepted in Pounds Sterling.

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Vol.40 No. 4
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British Society for the History of Pharmacy
840 Melton Road, Thurmaston, LEICESTER LE4 8BN

Founded 1967

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British Society for the History of Pharmacy

840 Melton Road, Thurmaston, Leicester, LE4 8BN
Tel: 0116 264 0083, Fax: 0116 264 0141, Email: bshp@associactionenterprises.com

The British Society for the History of Pharmacy was formed in 1967 under the aegis of the Pharmaceutical Society of Great Britain, having originated from its History of Pharmacy Committee.
BSHP seeks to act as a focus for the development of all areas of the history of Pharmacy, from the works of the ancient apothecary to today's ever changing role of the community, hospital, wholesale or industrial pharmacist.

Aims

Promotion of historical studies related to pharmacy.
Advancement of knowledge and propagation of understanding of the history of pharmacy.
Publication of the research work of pharmaceutical historians.
Preservation of pharmaceutical artefacts and historic pharmacies.
Support for the work of relevant museums and offering advice on establishment of other pharma-ceutical exhibits and on the preservation of pharmacies.
Co-operation with related professions and local historians on medico-pharmaceutical topics of mutual interest.

Pharmaceutical Historian

The *Pharmaceutical Historian* has been published since 1967, at first intermittently, but on a regular quarterly basis from 1972. Issues generally comprise 16 pages and cover.
An index for the years 1967-1995 was published in 1998. An index for 1996-2000 was published in 2000 and for 2001-2005 in December 2005.
Papers, short communications and letters in English on any aspect of the history of pharmacy are welcome and should be sent to the address above or by email to *bshpeditor@associationhq.org.uk*
Any illustrations are converted to monochrome for printing. Further details of requirements can be found on the website *www.bshp.org* under Publications.

Membership

Membership costs £20.00 per annum and includes:

Four issues of the *Pharmaceutical Historian*.

Regular meetings, with guest speakers, usually in November, February and May.

Visits to places of historic interest, museums, collections, botanical gardens, etc.

Annual Conference, usually in March/April.

Free use of Royal Pharmaceutical Society of Great Britain's library facilities for research.

Help in historical research and with the identification of artefacts.

Affiliation to the International Society for the History of Pharmacy (ISHP).

Affiliation to the British Society for the History of Medicine (BSHM).

Application forms are available from the Honorary

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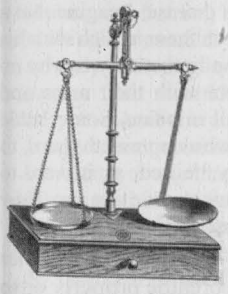

PHARMACEUTICAL HISTORIAN

Editor: Ainley Wade, BPharm, MPhil, FRPharmS, FSP
840 Melton Road, Thurmaston, LEICESTER LE4 8BN

Contents

Diary

Note earlier starting time for meetings

Wednesday 2 February 2011

'Nicholas Culpeper: London's first general practitioner?' By Professor Michael Farthing, 6.00 at Lambeth.

Wednesday 4 May 2011

'The History of Thalidomide' By Louise Medus-Mansell, 6.00 at Lambeth.

Wednesday 5 October 2011

'History of Medicines Registration' By Diane Leakey. 6.00 at Lambeth.

BSHP Spring Conference 1-3 April 2011
York Pavilion Hotel, Fulford, York.

The overall theme for the weekend will be **Pharmacy as part of Social History.** On Friday evening a speaker on the York museums will describe places to visit on the Saturday afternoon. On Saturday morning there will be short papers on Yorkshire and topics inspired by last year's reminiscences on changes in pharmacy. On Sunday, following the AGM, the theme will be 'Quakers and pharmacy' After-dinner entertainment on Saturday will take the form of 'Who am I' by the members. Please be prepared to give a 2-minute description of a fictional character or pharmacist for us to identify.

Full details of the conference and application forms are included with this Historian.

Further details from Shirley Ellis at 1 Willow Way, Bottisham, Cambridge CB25 9BS or by e-mail to *shirleyellis@shirlellis.plus.com*

40th International Congress for the History of Pharmacy
Berlin, 14–17 September 2011

The 40th International Congress will be held at the Berlin-Brandenburg Academy of Sciences and Humanities, Markgrafenstraße 38, 10117 Berlin.

The theme of the Congress is **Pharmacy and Books** – aspects will include books as sources of pharmacy history, pharmacists as authors and as subjects of fiction. Papers can be submitted as abstracts up to 31 May 2011.

Full details of the congress programme and the excursions for accompanying persons, with a booking form, can be found at www.40ichp.org/

Printed copies of the advance programme are available from Peter Homan (see back cover). It is expected that several members of BSHP will attend.

York Pavilion Hotel, Fulford, York.

Correction

An editorial error in the September 2010 issue (vol. 40, no. 3) of the *Pharmaceutical Historian* resulted in incorrect page numbers being given in the contents list on p 41.

https://doi.org/10.24355/dbbs.084-201803121421

Night-mare and its treatment

Dr Christopher J. Duffin
Sutton, Surrey

The Nightmare

Gaius Plinius Secundus (Pliny the Elder, 23-79 AD), famous Roman naturalist, author and philosopher, recorded in the entry concerning the Paeony in his *Historia Naturalis*, that

> The black grains taken to the number above said [foure drams] in wine, help those that be ridden with the night-mare, and in danger thereby to have their breath stopped.[1]

'Ephialtes' in Greek and 'Incubus' in Latin, this condition became entrenched in folk belief and literature as an affliction, but with some differences in expression, in both mankind and horses. In both cases, it has been associated with the activities of demonic nocturnal visitors. Through Anglo-Saxon times, these creatures were somewhat ill-defined as 'walkers-by-night' ('niht-genga') or given the name 'Mare', an Old English term for incubus.[2]

The subject inspired the famous painting (plus its derivatives) entitled 'The Nightmare' (1781; Detroit Institute of Arts) by Swiss-born British artist, John Henry Fuseli (1741-1825). Here, a sleeping maiden is oppressed by an incubus who is seated on her chest, while a wild-eyed horse peeps through a curtain, thereby associating the two folklore images of the night-mare as an oppressor of human sleep and nocturnal driver of horses. A similar image, but this time featuring a crippled old man rather than a nubile maiden, and minus the horse-head, was used by Waller in the frontispiece to his *Treatise on the Night-mare*[24] (Figure 1).

Symptoms

In terms of disturbance to a person's sleep, a wide variety of symptoms was associated with the night-mare. One vivid account of the experience is as follows:

> Many, which are taken with this disease, imagine that a man of monstrous stature sitteth on them, which with his hand violently stoppeth their mouth, that they can by no meanes crie out, and they strive with their arms and hands to drive him away, but all in vaine. Some ledde with vaine fantasie, thinke him who oppresseth them, to creepe up by little and little on the bed, as it were to deceive them, and anone to runne downe againe. They seeme also to themselves to heare him.[3]

Further symptoms commonly described for other sufferers include the inability to breathe properly or to stir from sleep, and an overwhelming fear, often issuing from vivid dreams:

> when one dreameth that be feeleth himselfe much greeued as he wer pressed or wronge together in the bodye, is a notice of benummynge or the nyghte mare.[4]

Contemporary explanations were that the person was being ridden by an 'old Hagge', 'that this Disease is occasioned by the Devil, or an Evil Spirit's lying upon their Stomachs', or that 'some external thing comes and lies upon them, which they fancy to be some Ghost, or Hob-Goblin'.[5]

Alternative explanations

Efforts from the medical community to counter this firmly entrenched folk belief began with Hippocrates (ca. 460–ca. 370 BC) and presented a plethora of alternative 'rational' explanations which became particularly persistent in late medieval and Elizabethan times, although at least one author conceded that in some cases spiritual oppression might indeed be a cause.[6] Levinus Lemnius (1505-1568), Dutch theologian, medical student under Vesalius (1514-1564) and friend of Conrad Gesner (1515-1565), for example, gives the following cause for the night-mare in women:

> And this thinge is to be obserued and marked in yonge lustye Damselles and Virgins, which remayne long unmaryed, or which by profession of chastitye are wayned and debarred from Wedlocke. For besyde their unruly motions of tickeling lust, besyde theyr secrete

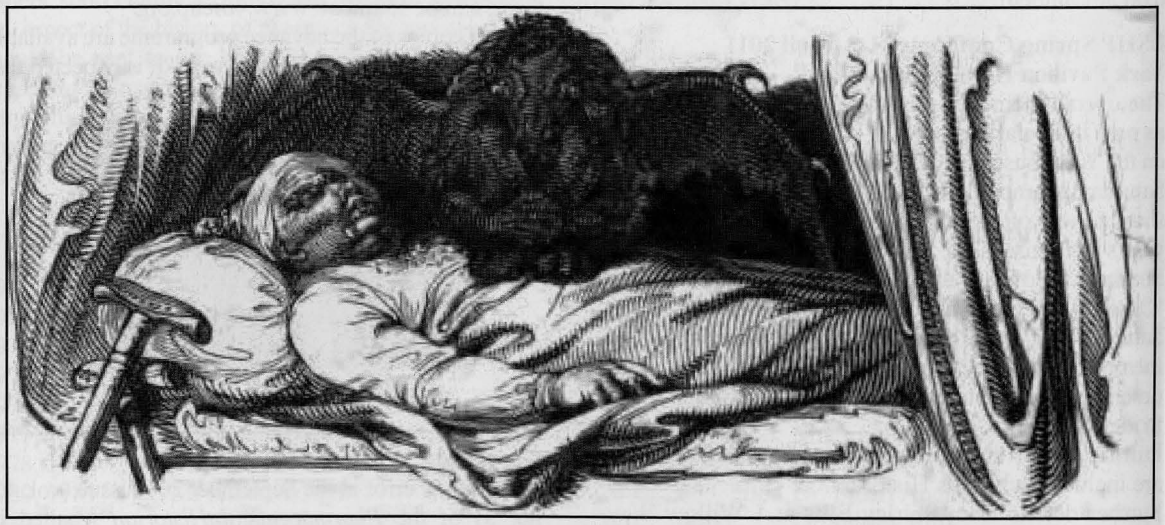

Figure 1. Nightmare: Incubus seated on a sufferer's chest. Frontispiece of John Waller's *A treatise on the Incubus or Night-Mare,* 1816.[24]

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flames and burning affections they be ill coloured, and nothing pleasauntly complexioned, their myndes unstedy and out of quiet frame, by meanes of a naughty vapour that ascendeth upward and disturbeth their brayne. And hereuppon it is, that sometyme in Imagynation, thinking themselues to lye wyth men by beholding or touchinge of them, they be troubled in theyr sleepe wyth the night Mare, and the effluxions of seede, wherw[t] they pollute themselues in the nighte season: Hereuppon commeth trembling & quaking of the heart, by reason of grosse fumes, which inuade the pannicle or coffyn of the heart, called *Pericardion,* and lye heauelye uppon the body pressinge it downe as though they were night Hegges, or Hobbegobblins.[7]

The general consensus in the 16th to mid-18th centuries was that 'animal spirits', originally explained by Galen (circa 129-216 AD) as being formed in the brain and passing through the nerves and mediating their activities, were somehow blocked or inhibited. The main culprits in this blocking of the normal activity of the brain were vapours ascending to the head from the nether regions. These might be 'naughty',[8] 'crude halituous',[9] 'flatuous'[10] or 'a feculent humor adhering to the vitall parts, and with its black or melancholy fume troubling the Diaphragma, Lungs, and Brain, and distempering the imagination with horrid shapes'.[11] On gaining access to the ventricles of the brain, these vapours, impossible to be dissolved or removed whilst asleep, ran the risk of being 'detained by the Winter-cold', thereby becoming thickened, narrowing the junction of the brain with the spinal cord, and consequently preventing flow of the animal spirits to the lower parts of the body – hence affecting respiratory muscle activity and limb mobility.[12] Condensation of the vapours in the head might lead to giddiness, coma or apoplexy, and could even be used to explain death whilst asleep.

Treatments

A wide range of interventions was commended. Since there was 'an over-redundancy of Blood in the whole Body', and the vapours ascended to the brain via the blood stream, bleeding was recommended in an attempt to evacuate them.[13] The use of sneezing powders made from white hellebore, pellitory, marjoram leaves, and lily of the valley flowers might eliminate any intransigent dregs of the vapours.[14] Further purging by a wide range of medicinal simples, including 'oile of Tabacco, a fewe drops taken in sacke or malmesie' was also recommended.[15] One enthusiast even recommended the antimonial cup; various alcoholic drinks could be boiled with antimony, a metalloid (Sb, most commonly found in the mineral stibnite), for several hours. A cup full would then purge the body from 'whatsoever is offensive to Nature' by means of vomiting, 'siedge' (bowel evacuation), extreme micturition and sweating.[16] It is interesting to note that excessive doses of antimonial drugs give rise to symptoms similar to those of arsenic poisoning.[17]

Other practical approaches involved lying alternately on the left and right sides in a bid to redistribute the humours,[18] removing excess bedclothes and avoiding lying on the back at all costs.[19] 'Windy meates' and other culinary excesses were to be replaced by a slender dietary regimen by universal agreement.[20] Clysters (enemas) were designed to evacuate the bowel, while 'gargarismes' (gargles), 'errhines' (medicines provoking increased mucosal secretions from the nostrils), 'apophlegmatismes' (medicines, like tobacco, which were chewed in order to draw away phlegms and humours), anointing the head with oil of chamomile, aniseed ointment and hot wine, and the application of 'fomentations' (hot packs) of aniseed oil, and wearing cranial quilts of powdered aromatic herbs were recommended for restoring the brain to its full capacity and function.[21] The application of a cupping glass to the calves of the legs, rubbing the back of the head and frequent combing of the hair were also deemed valuable techniques to use in these cases.[22]

In the cases of children suffering from the condition, since components of their milk might be causal factors, the wet nurse was commended to take a draught of posset ale infused with sage or betony leaves, or the roots or seeds of peony.[23] The children themselves should be bled at the neck, given black cherry water twice a day, and coral or peony seeds hung about the neck. If they woke during the night, a blister, presumably employing cantharides or Spanish blister beetle, was to be applied at the neck or behind the ears. Whilst I have concentrated on 16th and 17th century approaches to the medicinal treatment of night-mare here, it should be noted that it was still being treated as a disease in the early 19th century.[24]

Horses

A second strand to the night-mare theme involved stories of demons, pixies, cobbolds, night-hags, fairies or witches riding the horses at night. Although obscure in origin, this subject is the focus of a literature sparsely represented in medieval times, but becoming more prolific from Elizabethan times onwards.[25] At the close of a day's work, the horse was rubbed down, fed, watered and groomed only to find in the morning that 'you shall find him all of a sweat, one drop driving the other, panting, and sweating, principally in his Flanks, Neck, and roots of the Ears'.[26] Not only were the horses wild and excited, 'all of a muck sweat', they may have had straw twisted into their manes because the 'night-riders had been riding them all night'.[27] Plaited manes were accounted for in French versions of the legend as being due to fairies tying together locks of hair from the mane in a bid to fashion stirrups for their excursion.[28] This recalls the lines spoken by Mercutio in Shakespeare's *Romeo and Juliet* (Act 1 scene 4 lines 40-43):

This is that very Mab,
That plats the manes of horses in the night;
And bakes the elflocks in foul sluttish hairs
Which once untangled, much misfortune bodes.

Some animals were even reported to have been killed by these nocturnal rides.[29]

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Elizabethan farriers concurred with contemporary medical men as to the cause of the condition, mocking the folk tradition of the night-mare. As cures they commended a wide range of approaches. Good moderate exercise, both morning and evening, followed by a good rubbing down and a feed of oats mixed with a handful of hemp seed was one approach.[30] Another was to administer purging balls of tar, butter, aniseeds, liquorice, sugar candy and garlic cloves.[31] An alternative involved 'a pint of sacke, halfe a pinte of sallet oile, and two ounces of sugercandie mingled together and it will purge him cleare of the infirmitie'.[32] The use of peony, as introduced by Pliny 1500 years earlier, with the root hung about the neck, the juice given inwardly or seeds given in wine, is recommended by Gent in 1681. He also considers enforced sweating by giving 'Mistletoe of the oak given, mustard-seed, the seed of the black poplar, cinquefoyl, germander, hysop, St Johns wort, &c.' to be a useful approach, as well as allowing the hanging of 'a flint-stone over his head, or some old sythe or old Iron'.[33] This latter approach is also observed by the famous Wiltshire antiquary and author, John Aubrey (1626-1697) who writes:

> To hinder the Night-mare, they hang in a string a Flint with a hole in it (naturally) by the Manger; but best of all they say, hung it about their Necks, and a Flint will do it that hath not a hole in it. It is to prevent the Night-mare (viz.) the Hag from riding their Horses, who will sometimes sweat all Night. The Flint thus hung does hinder it.[34]

Gervase Markham (circa 1568-1637), prolific English poet and writer, is scathing in his criticism of this idea, writing:

> foolish smiths thinke such horses are ridden with the witch and that the disease is supernatural and therefore some of them goe about to cuer it by hanging a naked sword ouer the horse all night as if it would scarre the diuell, other seek to euer it by charms and night-spelles.[35]

Despite Markham's remarks, the amuletic use of holed flints in stables, domestic settings and even around the necks of individuals persisted well into Victorian times, although the status of the objects gradually declined to that of 'lucky stones' and was confined to rural communities in Sussex and a scattering of other counties by the mid-twentieth century.[36]

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The Treatment of Tuberculosis in Ferrara (Italy) in the 19th Century

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Summary

The present work is a review of the remedies in use in Ferrara against tuberculosis in the 1800s. The work started from the discovery of accounts describing methods and remedies. These remedies were also in use world wide. Of particular interest is the work by Antonio Campana, a famous professor of Pharmaceutical Chemistry and Botany in Ferrara, who wrote a pharmacopoeia which had several editions between 1797 and 1841. The *Farmacopea Ferrarese* was addressed to the apothecaries of Ferrara. Nevertheless, due to its great reputation it had an international distribution. It provided us with an exhaustive view about the medical field in Ferrara in the early 1800s.

The remedies adopted in the city in the second half of the century were in line with those present abroad. The work was also supported by the discovery of statistical accounts of the Sant'Anna hospital from 1871. The manuscript written by Alessandro Bennati enabled elucidation of the methods used to treat tuberculosis in the second half of the century. Bennati's work is an historical document completed by the work of the physician Cesare Minerbi.

Remedies against tuberculosis in the 19th century

After a very long discussion of tuberculosis in Spregel's work of 1816, *Stato della medicina nel decennio 1805-1814,*[1] *calce solfatata* (calcium sulfate) seems to be the only remedy used.

In the same period Brugnatelli[2] suggests Iceland moss tablets, *(Tavolette di Lichene islandico)* (*Cetraria islandica*), for chronic cough and tuberculosis, as well as *Digitale porporina* (*Digitalis purpurea*) and *Ononide spinosa* (*Ononis arvensis*) in case of haemorrhage, spitting of blood and consumption.

Iceland moss tablets were most commonly employed against tuberculosis. Nowadays we know much more about all the specific peculiarities of this drug (expectorant, sedative and antibiotic) thanks to the presence of usnic and cetraric acids and the emollient and immunostimulanting activities due to the polysaccharides.

In a collection of medical works[3] (1836) we have found the *Considerazioni estratte dal trattenimento del 2 giugno 1827*, an important document about pulmonary tuberculosis. The scientific world was still divided between the usual humoral theories of the time, and the Brownian theories. The author confesses to having employed mercury without success, in good measure and for a very long time, even if not sure that the tuberculosis was caused by venereal reasons. The same happened with the use of nitric acid and arsenical drops. He also admitted to having experimented with the Brownian method. This consisted in making patients tired with hard work, making them sweat, drinking a lot of wine and eating a lot of exciting food. The use of antimonials, barium chloride (*muriato di barite*), calcium hypochlorite (*muriato di calce*), or lead (*saturno*) were completely unsuccessful.

Antimonial preparations and ipecacuanha (*Cephaëlis ipecacuanha*), aconite (*Aconitum napellus*) and hemlock (*Conium maculatum*), myrrh (*Commiphora myrra*) and wood tar (*acqua di teda*) had been employed in the hope of avoiding surgery.

The best ways to avoid tuberculosis or stop it (except in the case of ulcerations) were a diet based on milk, or staying in healthy places such as lakes. Several unsuccessful attempts were made to administer by inhalation vapours of myrrh, chlorine (*doro*), *teda*, senega (*Poligala virginiana*), *acqua di teda* and sulfur; they were also very difficult to administer.

In 1849 Luigi Parola's theories were published[4] after he won an award of the medical-surgical Academy of Turin. Luigi Parola considered all the remedies proposed by the ancients (Hippocrates, Celsus, Galen, Sydhenam, Salvatori, 'Scuramore', 'Beherends', Bennet): i.e. hygienic rules; eating and drinking a lot; staying in Alexandria (Egypt); taking emetics, milk, opium, *vino emetico*, balsamic pills, cod-liver oil, hemlock; *calce, potassa e soda* (lime, potash and soda); decoction of sarsaparilla (*Smilax* sp.), quinine sulfate, *tintura di Marte* (iron salts), silver nitrate, naphtha, bleeding and revulsives. Other treatments included digitalis, iodine, iron iodide (*protoioduro di ferro*), cod-liver oil, naphtha, ammonium salts, hydrocyanic acid, Iceland moss, *Fellandrio acquatico* (*Oenanthe aquatica*), sodium chloride, and quinine (*chinacei*). Ergot (sclerotia of *Claviceps purpurea*) was considered the best. Haemoptysis (*cacciata di sangue*) was criticised, while emetics, digitalis and its active principle digitalin in particular, and iron iodide were considered good remedies. Cod-liver oil, rich in vitamin A, was also mentioned as a good dietary supplement, something helpful to fight against the illness and fortify the body.

In the second half of the 19th century in *Il Morgagni, Giornale indirizzato al Progresso della Medicina*[5] we can see how all these therapies were about to develop in the future. A common mistake was to confuse the fevers due to tuberculosis with those due to malaria and so to treat them with quinine sulfate. Some treatments, like iron lactate, calcium phosphate and cod-liver oil, were helpful thanks to their tonic characteristics. Barley

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extract was used instead of less tolerated oils. In intense fevers, quinine sulfate, opium and digitalis infusions were suggested. Turpentine essential oils were employed both as inhalations and internally to improve the sputum. Tannic and benzoic acids or juice of *Pinus pinaster* (*succo di pino marittimo)* were employed instead to decrease fever. Sage (*Salvia officinalis*) decoction was employed internally and externally to fight the abundant perspiration.

In cases of diarrhoea due to intestinal ulcers, astringents and mucilaginous decoctions, calumba root (*Jateorrhiza palmata*) or salep tuber (*Dactylorhiza maculata orchis*) with laudanum and chamomile flower infusions (*Chamomilla recutita*) were successfully employed. The opium tincture decreased intestinal secretion, the mucilage protected the ulcerated parts of the mucosa, while calumba worked as an antizymotic. In the same work arsenic was considered a good analeptic, with some doubts about its effectiveness.

Koch's tuberculin

1882 was the year of the discovery by Koch of *Mycobacterium tuberculosis* and a year of new ideas developing. First of all we find the idea of neutralisers (*neutralizzanti)*. The 19th century did not provide effective solutions in this field but it created the basis for the employment in the 20th century of streptomycin, isoniazid, rifampicin, pyrazinamide and ethambutol. Just after Koch's new theories several researches *in vitro* started.

In 1888, in a report (*Ricettario Tascabile*)[6] Professor Guiseppe Sormani studied 21 new compounds. In comparison to what he did in the previous reports of 1883, 1884 and 1885, he underlined the capability of wood tar (*catramina*), camphorated chloral, tribromophenol, ethyl bromide, *tert*-pentyl nitrite *(estere nitroso del dimetil-etil-carbinolo*) and aniline oil against Koch's bacillus: 22 of the 80 chemical compounds were effective, so it was necessary to evaluate their tolerance in man. Other new solutions appeared at the same time, with different opinions about Koch's toxitherapy or serotherapy for example.

At the end of the nineteenth century everybody was still convinced that it was impossible to avoid an illness like tuberculosis. Edoardo Maragliano (1849-1940), a doctor and rector of the University of Genoa, was a pioneer in this field when, at the International Bordeaux Congress in 1895, he supported a new thesis based on the possibility of a production of antibodies against tubercular infections. Eight years later, at the Madrid Congress in 1903, he could finally announce that he had been able to cure it by the use of antitubercular serotherapy.[7] In a publication[8] in 1896, Maragliano had been mentioned for having founded an establishment for serotherapy as a proper scientific laboratory. It also mentioned Koch's Lymph (*linfa di Koch*), or 'tuberculin'. Everybody was looking forward to a remedy for this illness. The tuberculin was obtained by evaporating the glyceric culture broth (*colture di brodo glicerinato*) where the tubercular bacillus was grown. This concentrated liquid contained all of the toxic materials derived from the bacteria.

In 1890-91 there were several discussions about this approach; in particular *Il Cracas Notizie e curiosità romane*,[9] mentioned results of experiments in Rome's hospitals and the growing business based on it. The same journal reported that *Linfa Koch* was being tried in Rome's hospitals.[9a] *Linfa Koch* was also reported in the *Note cronistoriche* of the 13 December, 1890 (Berlin) as being sold with government approval at 25 marks for each 5 g. Each injection cost 5 cents, but some doctors asked 300 German marks for each injection.[9b]

In *Cose nuove-Cronaca della capitale* (1891, January 3rd) it was reported that the sale of antitubercular lymph (*linfa antitubercolare*) to the Government earned Dr Koch 1 million marks and sale of preparations was worth about 4 million marks.[9c]

Experiments with the lymph were also practised in hospitals of other cities, such as Catania and Ferrara. Because of conflicting results some started to be perplexed about this approach, as happened in an essay[10] in Catania (1891): tuberculin is not a chemical compound that could be defined simply like sodium bicarbonate or hydrochloric acid: it is rather a more complex substance, so in the first experiments Koch might have have employed something different from that distributed later. So tuberculin could have changed while Koch was working on it. Zubiani (Sondalo 1869 – Milano 1921) described[11] in 1898 very precisely the different approaches through serotherapy and toxitherapy. The new *tubercolina* or *tubercolina R* was the aqueous extract of tubercular bacillus, while the old *tubercolina* was a glycerin extract.

In Koch's opinion the new toxitherapy he proposed aimed to immunise the body against the tubercular toxins, by stimulating the formation of antitoxins in the organism. Zubiani makes clear that the clinical experience was not very helpful, and that Koch's toxitherapy was no better than serotherapy, that is, injecting already formed antitoxins into the organism. Unlike poor people, the rich were able to 'cure' themselves with the latest remedies, whereas the poor tried to resist by consuming creosote and cod-liver oil that were given free by the *Congregazioni di Carità* or from the *Opere pie*. Moving to a better climate helped many patients.

In 1898 Zubiani decided to establish a centre to treat consumption near Pineta di Sortenna (Valtellina). *Ospizi Marini per gli scrofolosi* and *Colonie climatiche per il fanciulli* were both helpful because of their climate. From 1856 to 1896 another 20 centres arose from Viareggio to Venice (1868), Rimini (1869), and Riccione (1871). Alpine colonies appeared in Italy in 1881 for the first time.

1882 was both the year of the discovery of *Mycobacterium tuberculosis* by Koch and of the publication of some essays about tuberculosis by Carlo Forlanini (1847-1918, Pavia University) in the *Gazzetta degli ospedali e delle cliniche.* Producing an artificial pneumothorax *(pneumotorace artificiale*) was his

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solution to permit the repair of scars and wounds of the lungs. Only after the Rome congress of 1912 was it was recognised as the best cure.[12]

Cure for tuberculosis in Ferrara

We have chosen Campana's pharmacopoeia[13,14] as a good example to show the remedies and cures in the early 19th century. It will help us to understand how the treatments improved over the century. Antonio Campana (1751-1833), professor of Pharmaceutical Chemistry and Botany, wrote a successful pharmacopoeia for the apothecaries of Ferrara, that was used in several editions in Italy and abroad from 1797 to 1841.

In the 1803 edition tuberculosis is only referred to under nitrogen (*Gas Azoto o nitrogeno*, *Aria flogisticata off.*) (nitrogen, phlogisticated air). It is said to be helpful when it is inhaled. Besides *Azoto*, a larger variety of remedies was proposed in the 1841 edition.

Creosote obtained from wood tar was good for the treatment of pulmonary tuberculosis, for ulcerations. It claimed that medical experience did not confute the efficacy of creosote to cure chronic pulmonary diseases. Iceland moss (*Lichen islandicus)* that was cooked for a long time in water formed a sort of gel considered very helpful against pulmonary tuberculosis. It had tonic and analeptic properties with many advantages in chronic cases, for instance, when the patient needed to be strengthened to resist and defeat the illness. Tablets were made up of mucilage, gum arabic, sugar and a small dose of opium. *Phellandrium aquaticum* had depressing properties and had been prescribed in cases of tuberculosis and catarrhal affections. About the white agaric (cited in Campana as *Boletus purgans*) it is written that Bisson in Paris employed it, sometimes together with opium to avoid nocturnal perspiration.

Hydrocyanic acid (*Acido idrocianico, Acido prussico*) was used for its anodyne and antispasmodic properties, even if there was the possibility of collateral effects and poisoning. Bromine could be prescribed for pulmonary tuberculosis by in the form of pulmonary fumigations. Based on opium, starch and calcium chloride (*estratto gommoso d'oppio)*, the *Clistere di Cotterau* was used against diarrhoea in patients affected by tuberculosis, while *Grasso con idrobromato di ferro di Cotterau* (pomade based on iron bromide, bromine and lard) was employed against amenorrhea.

Other remedies mentioned in the literature of this century are also present in Campana's pharmacopoeias, even if without specific reference to tuberculosis. *Catrame* (wood tar), as *Acqua di catrame o Acqua di Teda* were suggested to cure chronic pulmonary catarrh. Creosote is also a wood tar. Ipecacuanha, and the emetine contained in it, in very small doses, were suggested in cases of chronic catarrhal disease and diarrhoeas. Emetine in small doses is an expectorant, while at higher doses is an emetic. It was employed originally to cure bronchitis and coughs, by helping with the secretion. Dover's powder (*Polvere di Dower* or *Polvere di ipecacuana*) is made up of opium and sugar.

Senega, (cited in Campana as *Poligala virginiana*) was used against fevers and pulmonary inflammations as an expectorant: the presence of saponin helped with bronchial secretions.

Tuberculosis treatments in Ferrara: the Bennati manuscript

An 1871 manuscript by Dr Alessandro Bennati[15] provides detailed and complete information about the treatments for tuberculosis used in Ferrara. The entries for tuberculosis-related conditions (shown in Table 1, p. 65) (*Malattie dell'Apparecchio vocale respiratorio, Tubercolosi polmonare, Malattie dell'Apparecchio digerente e dei suoi annessi, Tubercolosi intestinale e mesenterica)* show 109 hospitalised patients (50 male and 59 female). The majority of the patients died because of this illness .

Between January and August, 230 hospital patients were recorded in the male section of the 'Diseases of the respiratory and vocal apparatus' (*Malattie dell' Apparecchio vocale respiratorio)*, in the winter period mostly. The causes were *catarri bronchiali* (76), *pneumoniti* e *bronco-pneumoniti* (61), *pleuriti*, *pleuro-pneumoniti* (48), and *tubercolosi pulmonari* (36). In acute cases general bleeding with leeches, antimony, kermes, antimony sulphide (*solfodorato d'antimonio*), and Dover's powder were helpful. Mucilages with laudanum (*Mucillagini di gomma laudanizzati*) were employed to alleviate cough and the distress of the sick. In the worst cases vesicant plasters, cantharides (*Mosche di Milano*), applied to the arms or the chest, were more efficacious. Kermes and Dover's powder together with camphor were given in particular cases of pneumonia. The same Dover's powders were administered together with potassium iodide. Mucous expectorants (*Espettoranti mucillaginosi*), decoctions of lichens with milk, and lichens with cinchona bark (*china*) were used, particularly in pneumonia, to support body strength and resilience. Cod-liver oil was employed as an analeptic for tuberculosis and quinine sulfate for vespertine (evening) fevers, also with Dover's powders. Cantharides (*Mosche di Milano*)were applied to the collar-bone, lateral chest and breastbone, with leeches to mitigate aches.

Among the 230 patients, 142 were 'cured' (37 not completely) and 51 died. In this pulmonary section there is not so much difference between remedies for tuberculosis and other diseases of the breathing apparatus, unlike what we will see later on. The use of leeches (*mignatte*) was common. In Campana's Ferrarese Pharmacopoeia we find the terms: *Mignatta, hirudo medicinalis, verme acquatico ... per estrarre sangue.* It also describes the artificial leech [for sucking out blood through a tube] (*mignatta artificiale ... cannello con stantuffo ... estraendo l'aria succhia il sangue*).

Antimonials were often used, particularly *kermes* and *solfo dorato d'antimonio*. Kermes is described by Campana as *idrosolfato di antimonio,* excitant,

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		Male wards		Female wards			
		January-August	September-December	January-April	May-August	September-December	Total 1871
Diseases of the respiratory and vocal apparatus;	Hospitalised	36	13	31	16	11	107
Pulmonary tuberculosis	Died	21	7	19	6	6	59
Diseases of the digestive system and related organs;	Hospitalised	1	0	1	0	0	2
Intestinal and mesenteric tuberculosis	Died	1	0	1	0	0	2

Table 1. S. Anna Hospital's Medical Division: statistical report (1871)[15]

diaphoretic, expectorant and evacuant. It was used for some acute fevers in order to help the perspiration, in scrofular disease (*malattie scrofolose*), glandular swellings (*tumori glandulosi*), and chronic lung disease (*affezioni croniche del polmone*). The *solfo dorato d'antimonio* is reported as a particular preparation of kermes. Ipecacuanha is contained in Dover's powder together with sugar and purified opium.

The *Mosche di Milano* were a revulsive poultice made up of colophony and turpentine (from *Pinus* resin), cantharides (Spanish flies or vesicant flies), euphorbia powder (*Euphorbia* sp.) and storax (from wood of *Liquidambar orientalis*). Revulsives are chemical or physical agents whose application on the skin causes a local irritation; they can be defined as rubefacients and vesicants according to whether they cause simple reddening or skin blisters. As reported[16], revulsive remedies were employed to remove the cause of the illness by attracting the *umori* in another distant part of the body (latin: *revellere*). Laudanum, Iceland moss, china and cod-liver oil were also used.

36 male patients were hospitalised because of tuberculosis and 21 of them died. In the four months from September to December there had been 13 hospitalised patients (from 15 to 40 years old) and 7 of them died. The treatments were as above: with decoction of Iceland moss or china, *mucillagini laudanizzate*, Dover's powder, and quinine sulfate, *mignatte ai luoghi dolenti*, and revulsives applied to the chest or arms.

In the female section of the Diseases of the respiratory and vocal apparatus, 31 people were hospitalised from January to April and 19 of them died. Most of the cases were aged 7 to 14 or 20 to 40. The treatment helped the patients to recover from weakness or poor nutrition. So, cod-liver oil, starch or iron iodide and other iron preparations were used to strengthen the sick. Dover's powder, digitalis, quinine sulfate, ipecacuanha infusion, *emulsioni con laudano*, opium, tannin and ergot were all good remedies for cough, hemoptysis, recurrent diarrhoeas, vespertine fevers and helping expectoration.

Mignatte and revulsives applied to the chest or to arms helped to palliate acute pain; decoction of Iceland moss or china, milk and meat sustained the patient. However, 19 of the 31 female patients died because of diarrhoea, a common complication of the last steps of the disease.

As we can see in Table 2 (p. 66), in comparison to the previous charts, iron salts and digitalis are still used and for the first time ergot is employed.

From May to August, 15 patients aged between 20 and 40 were hospitalised and 6 died.

Analeptics, *ricostituenti*, decoction of Iceland moss or milk, and simple or ferruginous cod-liver oil were employed. Quinine sulfate was used against fevers. Squill oxymel and laudanum were employed to calm coughs and help expectoration, with vesicants to the chest or to the arms. Iron peroxide with tannin or rhatany, iced *limonee minerali*, tamarind and *diascordio* with laudanum were used to stop the diarrhoea, while *misture ricreanti* helped to fortify in the last phase that usually brought death.

The squill oxymel (*ossimiele scillitico)* combined honey with squill vinegar (*aceto scillitico*) to maintain the stimulant, emetic and caustic qualities of the squill (*Urginea maritima*) (Ferrarese Pharmacopoeia). Rhatany is mentioned by Campana as *Krameria triandria*. It seems to be the most effective astringent for loss of blood: the powdered dry extract was used as a haemostatic on wounds.

Iced, diluted mineral acid solution (*limonee minerali*), tamarind and *diascordio* with laudanum were employed to stop the diarrhoea. Campana says

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Preparations	Male wards		Female wards			Total*
	January-August	September-December	January-April	May-August	September-December	
Revulsives or revellents**	1	1	1	1	2	11
Rubefacients or vesicants	1	0	1	0	0	
Cantharides (Mosche di Milano)	2	0	0	0	0	
Mustard plasters (Senapismi volanti)	0	0	0	0	1	
Decoction of Iceland moss	1	1	1	1	1	8
Decoction of lichens with milk	1	0	0	1	1	
Dover□ s powder	3	1	1	0	2	7
Emulsion or mucilage with laudanum	1	1	1	0	0	6
Laudanum	0	0	0	1	1	
Gum emulsion (Emulsioni gommose) with Sydenham' s laudanum	0	0	0	0	1	
Cantharides (Mignatte)	1	1	1	0	2	6
Bleeding with leeches (Salassi generali con sanguisugio)	1	0	0	0	0	
Quinine sulfate	1	1	1	1	2	6
Cinchona decoction	1	1	1	0	1	4
Cod-liver oil	1	0	1	1	0	4
Ferruginous cod-liver oil	0	0	0	1	0	
Antimonials, kermes, antimony sulphide (solfo dorato d'antimonio)	2	0	0	0	0	2
Cordial tonics (Cordiali tonici)	1	0	0	0	0	2
Etherised cordial mixtres (Misture cordiali eterizzate)		0	0	0	1	
Digitalis	1	0	1	0	0	2
Ergotin	0	0	0	0	1	2
Ergot	0	0	1	0	0	
Iced, diluted mineral acid solution (Limonee minerali in ghiaccio)	0	0	0	1	1	2
Tamarind	0	0	0	1	1	2
Tannin	0	0	1	1	0	2
Analeptics	0	0	0	1	0	1
Camphor	1	0	0	0	0	1
Meat	0	0	1	0	0	1
Electuary diascordio with laudanum (p 67) (Diascordio con laudano)	0	0	0	1	0	1
Gum emulsions (Emulsioni gommose)	0	0	0	0	1	1
Mucous expectorants	1	0	0	0	0	1
Ipecacuanha infusion	0	0	1	0	0	1
Starch iodide	0	0	1	0	0	1
Iron iodide	0	0	1	0	0	1
Potassium iodide	1	0	0	0	0	1
Milk	0	0	1	0	0	1
Opium	0	0	1	0	0	1
Squill oxymel (Ossimiele scillitico)	0	0	0	1	0	1
Iron peroxide	0	0	0	1	0	1
Tannin and opium pills	0	0	0	0	1	1
Iron preparations (Preparati ferruginosi)	0	0	1	0	0	1
Rhatany	0	0	0	1	0	1
Cachexia treatment (Ricostituenti o misture ricreanti)	0	0	0	1	0	1

* number of times the remedy had been mentioned

** revulsive effect = revellent: one of the physiologic principles used in hydrotherapy to modify blood circulation. The alternating applications of heat and cold to increase the blood flow through a body part.

Table 2. Treatments prescribed in the Medical Division at S. Anna Hospital from statistical report (1871)[15]

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tamarind (*Tamarindus indica*) is efficacious against dysentery. According to Campana *Elettuario diascordio*, used with tamarind as a remedy for diarrhoea, was made up of *foglie di scordio (Teucrium scordium* leaves), *catecù* (from *Acacia catechu), cannella* (*Cinnamonum zeylanicum*), *radici di tormentilla* (*Potentilla tormentilla* root), *oppio purificato* (opium), *miele depurato* (honey), and *vino di Spagna*. An electuary consisted of powders mixed into a paste or syrup with honey or syrup.

In the next four months 11 people had been hospitalised and 6 of them died. Their age was between 20 and 30, except for three cases between 45 and 50. In five cases of this illness, not yet in an advanced state, Dover's powder together with quinine sulfate, decoction of Iceland moss and milk, *emulsioni gommose* with *mignatte,* and revulsives applied to the breast or the arms were useful for treating patients. The last ones left hospital after 20-30 days. In the other six cases with more advanced illness, Dover's powders were employed together with quinine sulfate, *emulsioni gommose* with Sydenham's laudanum, decoction of Iceland moss and cinchona bark, revellents to the breast and to the arms.

Senapismi volanti and *mignatte* were sometimes used to treat pains. *Senapismo* is a plaster prepared with de-greased flour of black mustard (*Brassica nigra*), kneaded with warm water into a revulsive plaster. Tannin and opium pills, tamarind with laudanum, iced *limonee minerali* were employed to stop the diarrhoea. The same astringents and ergotin were mostly used for haemoptysis. *Misture cordiali eterizzate* were useful to support weak patients, who died however.

Liquid Sydenham's Laudanum, mentioned in Campana's works, contained purified opium, saffron (*Crocus sativus*), cinnamon, alcohol and Spanish wine. Ergot is not mentioned, only ergotin.

In the section of the report 'Diseases of the digestive system and related organs' (*Malattie dell'apparecchio digerente e dei suoi annessi*) two cases of intestinal and mesenteric tuberculosis were mentioned (a soldier about a 27 years old and a 34-year-old woman). The only treatments were *tonici* and *cordiali*. Both died.

Alessandro Bennati had been very precise in other cases, by recording all the patients to whom he administered the medicines and how many times (Table 2).

Revulsives, such as rubefacients, vesicants, *mosche di Milano* and *senapismi*, decoction of Iceland moss, Dover's powder, *mignatte*, general bleedings with leeches, quinine sulfate and decoction of china, and cod-liver oil were mainly used. Antimonials, kermes, solfodorato di antimonio, digitalis, *limonee* and tamarind were also used.

In the concluding pages of Bennati's report was a table analysing all the people who died of incurable diseases: 3 gangrene, 13 cancer, 45 cardiovascular diseases, 14 marasmus, and 61 tuberculosis.

In 1800 tuberculosis was much more lethal (45%) than any other cardiovascular illness (33%).

Cesare Minerbi

Cesare Minerbi was another expert in the field, who was born in 1856 and died when he was almost 100 years old. He married a poor, but good at her work, nurse of the hospital whose name was Emma Marchi. In 1938 the famous writer Giorgio Bassani, who was the son of Dora Minerbi, published his works under the name Giacomo Marchi because of race problems, by assuming his Aryan grandmother's surname. Minerbi was a very important person, not only because he was Bassani's grandfather.

His works as a volunteer were reported:[17]

> 'Dr Cesare Minerbi, who works free as doctor for the Victor Emanuel Infant Asylum and to the Jews of this city, works as a substitute assistant in the Civil Hospital'.

In the academic year 1881-82 Minerbi taught Anatomy at the University of Ferrara and was also *primario*, chief physician, for 40 years at the Sant'Anna Civil Hospital. He was considered 'a kind of holy man much loved by four generations of Ferrarese people' He looked after tuberculosis, both professionally and for the dissemination of knowledge. In his 1887 essay *La cura della tisi da un nuovo punto di vista Argomentazioni e Proposte del dott Cesare Minerbi*[18] he writes (for more than 60 pages) about benefits related to rest in the open air (**Figure 1)** while mentioning some

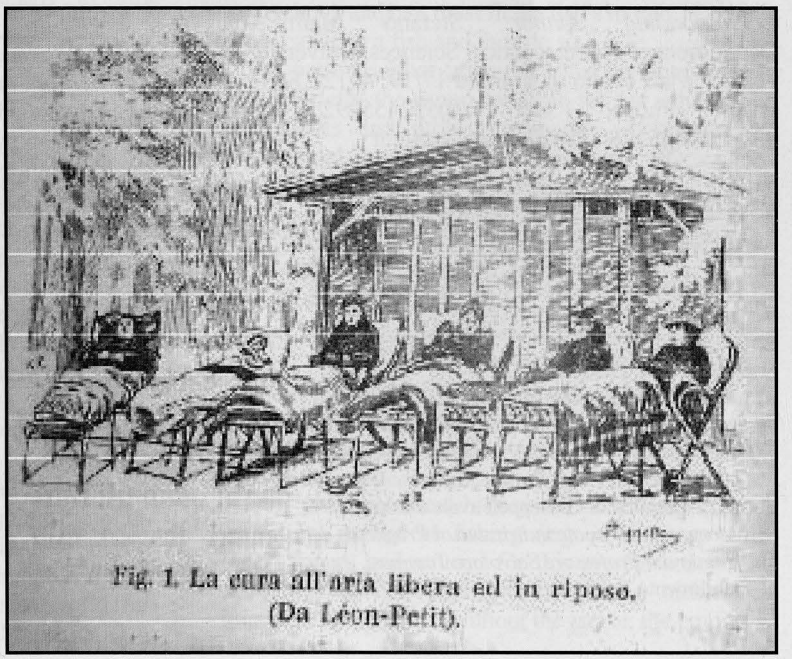

Fig. 1. La cura all'aria libera ed in riposo. (Da Léon-Petit).

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remedies. In his opinion, antipyretics for fever and morphine for cough were just a solution for secondary problems, and losing sight of the cause.

He reported both what was really efficacious and what was no use as treatment, from Jacoud's potion to the sodium benzoate inhalations by Rokitanski or antiseptics in general after Koch's discovery.

Nevertheless there was nothing miraculous, so that people in 1886 continued to die because of tuberculosis, just as happened in Hippocrates' time. After having established that the climate was an important issue to help recovery, he discussed how to choose the best place for it. Minerbi was fascinated by the success of Koch's tuberculin. He said that this method should have been practised at Sant'Anna Hospital, helped by a microscope. So Ferrara was consistent with the most advanced hospitals of that time.

Conclusions

No conclusive solutions for tuberculosis were found in the nineteenth century, but research moved towards more appropriate treatment. The disease occupied a central place in the Romantic imagination. It was widely believed that consumption could actually enhance creativity.[19] Tuberculosis patients were said to be possessed of unique strength of mind called the *spes phthisica*. This was a state of hopefulness and creativity which belied a patient's debilitated and frail condition due to tuberculosis. The idea of a *spes phthisica* reached its zenith in Paris in the 1820s and 1830s when 'consumption' became a fashionable disease. Carl Maria von Weber, Frederick Chopin, who was treated with lichens, and later Edvard Grieg, suffered from tuberculosis.[20] The early nineteenth century was an age of revolution, opium eating and early death which paradoxically spawned great advances in the arts and sciences.

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Ingenious pharmaceutical historical objects through social scientific spectacles

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The *raison d'être* of pharmacy is the empirical substance of certain objects, especially the medicines, themselves. This may be self-evident to an older generation of pharmacists familiar with extemporaneous dispensing. However, it is arguably less self-evident to younger pharmacists, who are more familiar with advising on, and prescribing, medicines. Those pharmacists' contact with actual medicines may be so indirect that they have 'forgotten' that, without the medicines themselves, there would be nothing upon which to advise. Pharmaceutical history, especially its concern for materia medica (e.g. Lapis de Goa), early synthesised drugs (e.g. aspirin), compounding equipment (e.g. a mortar and pestle), premises and other material objects (e.g. prescription books) offers a timely counterbalancing reminder.

Theory

This paper outlines elements of social scientific theory that perceive actual physical objects as important. It then tours the world of pharmaceutical objects using those perspectives to address ingenious objects. That gaze[1] first alights on small objects and subsequently focuses on ever larger ones.

Medicines are *things*; they are not, for example, talking cures such as psychotherapy. Sociologically, medicines can be seen as 'signs'. Humans are trained to behave in certain fashions varying with the context; for example, motorists stop at red traffic lights.[2] Everyone must know what to do if the sign appears (i.e. stop) and how to use the signs to make the situation appear (i.e. drive to traffic lights and watch them). Applying this to medicines, a patient is socialised to take the medicine as directed and to go to a pharmacy to make the medicine appear.

To anthropologists, medicines are 'thingified verbal signs'.[3] Note the crucial adjective '*thingified*'. Medicines are, in everyday language, things: objects. Those medicines have '*itness*'[4] and the intrinsic power to heal. They are generally a sort of artefact that the Oxford Dictionary defines as 'an object made by a human being, typically of cultural or historical interest'. We might presume that the earliest objects used as medicine (e.g. plants), before records began, were found, serendipitously, to heal and so were used again; this must be, however, speculation.

Later, objects were *designed*. Moreover, over history, design improved or evolved. To the designer Christopher Jones, design is a hybrid activity that, for successful completion, requires the proper blend of art, science and mathematics. It is most unlikely to succeed if confined to one area. The main difference is timing. Artists and scientists operate on the physical world (real or symbolic) as it exists in the present. Mathematicians operate on abstract relationships that are independent of historical time. But designers are forever bound to treat as real that which exists in an imagined future and have to specify ways in which the foreseen thing can be made to exist.[5]

Those designed objects, those clever contrivances, are ingenious. It is as if the thought is 'crystallised' within them. Each object, within its substance, can be perceived to possess a 'kind of intelligence'.

A final theoretical slant on these designed objects matters. Philosophers since antiquity, and countless ordinary people with existential concerns about the meaning of death, have agonised over the 'two body problem': the seeming disconnection between an individual's *physical* body and abstract, apparently 'free-floating', *mind*. Some feel there must be some sort of connection and wonder what it is. Arguably, if this is a truly philosophical question, it cannot be answered. However, the medical practitioner and philosopher Leder has had a go; a telegraphic outline of his metaphor (that natural scientists would call a model) follows.[6]

Within our body, the sixth sense of interoception (from pain receptors etc) and proprioception (e.g. balance from inner ears) is important. Much of our body (e.g. alveoli of lungs) feels 'absent' because it has no nerves. We may only notice an internal disease process (e.g. a spreading malignancy) after a part of the inner body with nerves is affected. When we notice such a message it has the ring of truth; it commands immediate attention.

Leder notes that to 'master' our world, including our own bodies, we need *tools* to supplement our own physical powers. One end of the tool is adapted to human anatomy. For example the handle of a fishing rod fits the hand. The other end of the tool is adapted to the world upon which we act, for example, the line, sinker, hook and bait must fit the fish's mouth. We think about catching a fish and then do so.

The present author interpreted this for pharmacy in 1996.[7] Briefly, the expert hands on the rod are those of pharmacists and other practitioners, buttressed by professional institutions, such as the pharmacists' professional body, the pharmaceutical industry and government. The hook, line and sinker is the *drug* that pharmacists and others formulate into *medicines* (historically using a mortar and pestle, today generally in industry). The wriggling bait is the prescription and labels, pharmacists' personalisation and counselling and the physical delivery devices, such as low boiling point propellants for inhalers. The mission is to penetrate the inner depths of patients' bodies and to stop the interoceptive clamour. We think about healing and then do so.

Over pharmaceutical history we have become more and more skilled at fishing (e.g. a move towards concordance) and, crucial for this present article, the design of all the parts of the fishing tackle has improved. Put bluntly, without the tackle, the empirical

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objects (medicines etc), we could not fish (*heal*). Having donned those social scientific spectacles, let us start our tour.

Molecules

We will first consider objects of molecular size: the drug molecules themselves. Reserpine is one example. Its actual molecule was not isolated until 1952, although Rauvolfia serpentina roots, a crude variable mixture, had probably been in use for 3,000 years.[8]

Viewing using one allopathic model of contemporary Western biomedicine, ideally, reserpine's molecular architecture interacts only with the actual molecular object required. Note again that it is an *object*: a biochemical target receptor – and not some other receptor.

A notorious example is thalidomide: a mixture of two chiral enantiomers. One, the 's' or 'sinister' in Latin,[9] was a safe effective sedative. The other, the 'r' or 'rectus' in Latin, was teratogenic.[10] We learned that bitter lesson in the mid twentieth century. Today, a new drug is designed to contain only one isomer. Research into the actions of specific isomers and the approval of an immensely detailed report has become a regulatory requirement.

Put differently, it has become our culture that some of pharmacists' fundamental objects must be sufficiently 'clever' to occupy the correct (molecular) hand that produces 'good', rather than unwanted or no, pharmacological effects. Even considering perfumes in cosmetics or medicaments, the terpene limonene of one hand (r), is partly responsible for an orange odour; the other handed limonene (s) offers a lemon or turpentine odour.[11, 12] Those are (olfactory) *signs*; the one expected will be welcomed and more saleable; the other less acceptable and less profitable.

Another illustration is a specific live vaccine that stimulates *in vivo* production of just the antibody demanded. Edward Jenner famously developed the first vaccine for smallpox (from cowpox) in 1796. The author, working in a designated fever hospital, was vaccinated against smallpox around 1967; smallpox was eradiated globally in 1980.[13] He has just received an influenza vaccine including against swine flu that is perceived a contemporary risk. As infectious disease risks changed, so did the vaccine. The fishing tackle has been updated.

Drug discovery includes trawling research literature. As recently as the 1960s, that demanded visiting a library and excavating within 'the stack' (of papers). Today, just clicking a search engine on a computer may suffice. It may connect, through fibre optic cables, hyperspace, satellites and humming servers, to a network of computers spanning continents, in the blink of an eye. Analytical machines compare samples with internal libraries of characteristics; percentage matches are ranked. Molecules predicted to perform well are screened. One generation ago such ease would have been science fiction. An example is the computer operating system termed LCARS (an acronym for Library Computer Access Retrieval System on board a spaceship depicted in *Star Trek*). A few generations before it would have been magic. That 'evolution', from magic to fiction to fact, reflects the quotation from The Talmud, a 2,500 year old religious work, that we do not see the world as it is but as we are. That perspective, anathema to many natural scientists, is generally thought self-evident by social scientists.

Medicines

Pharmacists' macrological objects, their formulated medicines, are also crucial. The portions of various pharmaceutical dosage forms have changed over history, such as fewer liquids and more solids between 1910 and 1980.[14] The very shape of those thingified signs makes it obvious, to us, how to use them.[15] For example, a conspicuous, metered dose aerosol button, when depressed, contains sufficient 'sense' to deliver exactly one dose. Similarly, a patch 'cleverly' adheres to skin, while it is the nature of some sustained release patches, such as nicotine, to release over say 24 hours. In such objects, not just the active drug but also excipients and packaging are designed to fabricate the 3-D object's system.

Calendar packs of oral contraceptives are designed to facilitate daily administration. They have been around for so long – since the 1960s – that we have forgotten just how clever they are. When a dose is removed the pack is defaced. If the dose has been omitted, the intactness of the packaging confirms omission. That object seems clever enough to remember. The idea for 'arrangements for time indication or reminder for taking medicine, e.g. programmed dispensers' has been around since 1915. On the 17th October 2010, approximately 1,260 patents existed.[16] Readers may wish to check how many exist at the time of reading; the author suspects that the number may be even larger. Today, some packs, such as for anti-malarial prophylaxis using chloroquine weekly and proguanil daily, prompt compliance although both are within the same strip.

Sometimes the object asserts its intelligence more decisively. The following illustration provides powerful evidence that objects appear to possess a kind of intelligence. It is leeches. They are presumed to be important in pharmaceutical history because they have featured more than once in the *Pharmaceutical Historian.* They were first used about 2,000 years ago.[17] Today, not just any common or pond leech but a pharmaceutical leach, *Hirudo medicinalis,* properly healthy, starved, cleansed by storage in clean water and not used on a previous patient, will bite, inject hirudin, hyaluronidase and calgin and suck blood in, for example, situations involving difficult microsurgery.[18, 19] Leeches are 'intelligent' enough to undertake that role of their own volition. It is their intrinsic nature.

An inorganic illustration is British medical gas cylinders up to size E possessing a pin-index safety system (PISS) [sic].[20] It only fits a manifold for that gas. An illustration is an oxygen cylinder only fitting an oxygen pipe, a nitrous oxide cylinder, a nitrous oxide

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pipe and so on. If they differ, that connection hisses gas to the atmosphere so no gas circulates along the pipe.

Other heritage objects

The Royal Pharmaceutical Society's coat of arms includes seven symbols iconic of pharmacists' heritage; this article focuses upon two. They were more objectively, or at least more democratically, selected than were other objects in this report, being 'deemed by members to be part of the heritage and they did not want to lose it.'[21]

The first is an alembic and receiver. The design of a still means that, on heating, refined distillates of specific increasing boiling points condense. The alchemist who first applied it to produce nearly pure ethanol was Arnold of Villanova, born in Spain in the fourteenth century. It was found to disinfect, to clean wounds.[22] Another illustration is coal. It may be fractionated into various materials including coal tar; phenol was one valuable ingredient. For early distillations, such as of chloroform, industrial production equipment was a scaled-up version of that used in the 19th century laboratory. Designs progressively improved. For example, in the Morson factory in 1930, early chemical engineering was making changes to the plant, and equipment benefited from special steels.[23]

An important illustration, as the medicine remains in use today, is (medical) oxygen. The German engineer Dr Carl Paul Gottfried von Linde (1842-1934) developed new refrigeration cycles. In 1892, an order from the *Guinness* brewery in Dublin for a carbon dioxide liquefaction plant drove Linde's research into low temperature refrigeration. In 1894, he started to design a process for the liquefaction of air. In 1895, Linde first achieved success. He filed for patent protection of his process but this was not approved in the USA until 1903. In 1901, Linde began developing a technique to obtain pure oxygen and nitrogen based on the fractional distillation of liquefied air. By 1910 co-workers including Carl's son Friedrich had developed the *Linde* double-column process, variants of which are still in common use today.[24] The author, as a sometime EU Qualified Person (QP) for medical gas companies, appreciates that such a facility, as designed, maintained and operated under standard operating procedures and material specifications, can only deliver liquid oxygen through its outlet. Anything else, and, to quote the word used by a plant engineer, the facility would 'break'. Moreover, air separating columns demand colossal quantities of electricity, and so, whenever possible, are situated next to electricity generating stations to benefit from electricity at a discount. That pair may be perceived as gargantuan dual 'intelligent' pharmaceutical objects.

The second symbol, the mortar and pestle that comminutes softer material, towers, in splendid isolation, on a kind of altar above the rest of the coat of arms. Sociologically, elevated position, compared with lower-placed objects, is often associated with higher status. That suggests that this symbol is particularly important. The English 'mortar' derives from the Latin *mortarium*, meaning 'receptacle for pounding'. The Latin *pestillum* led to the English 'pestle', meaning 'pounder'. The Roman poet, Juvenal, applied both *mortarium* and *pestillum* to articles used in the preparation of drugs; the mortar and pestle has long been a pharmacist's or apothecary's sign.[25] The antiquity of these objects is well documented. Examples are the Egyptian Ebers Papyrus (c. 1500 BC) and the Bible.[26, 27]

The sign of the mortar and pestle remains ubiquitous in British pharmacy. Many pharmaceutical pestle heads are constructed of unglazed porcelain; generally such pestle handles are constructed of wood. This is known as a Wedgwood mortar and pestle and originated in 1779.[25]

The comparatively uneven surfaces of a round-headed *unglazed* mortar, stirred with a rotating wrist action, *secundum artem*, with an *unglazed* pestle, shears oil and water phases together to facilitate the emulsification of droplets. The pestle may instead be pounded into the mortar to comminute solids; glass construction may be more suitable for small masses. Note that pounder and pounded must be things: *objects* – mere advice on pounding alone is probably prudent but is not sufficient. Put differently, were this verbal sign not *thingified* it would not work. Some solid active pharmaceutical ingredients must conform within a particular particle size range: too small and they will be too potent; too large and they will lose potency. For example, in the 1970s, tablets of *Lanoxin* and various generic digoxins were found to differ in bioavailability.[28] The author used a hammer mill to micronise sterile antibiotic powders in 1968, within a building used as a military camp during World War II. Today, micronisation routinely uses a fluid energy mill. It comminutes by pounding particles of an active pharmaceutical ingredient against each other using a compressed gas stream (e.g. air or nitrogen) in a meticulously designed chamber as part of high-tech modern facilities.

Pharmaceutical industrial production lines are amongst the smartest objects. An early precursor might be considered the ordinances of the Guild of Pepperers of Soper Lane in 1326.[29] More recently, tablets may be packed into bottles and a label and package insert added before placing into a carton. That is the function of the manufacturing premises and contents. For example, production equipment is isolated in a line without crossovers. That reduces the risk of mix-ups. Another example is an aseptic area, with coved corners that are easily cleaned. The area is designed to be pumped with filtered clean air, at positive pressure compared with surrounding areas. That factory (work)shop floor is part of the arenas in which codes of good pharmaceutical manufacturing practice (GMP) are applied. The abbreviation 'cGMP' is often used; 'c' stands for current; the previous version has become history. The first British '*Orange Guide*' to GMP was introduced in

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1971 after the Devonport incident where contaminated dextrose injection resulted in fatalities. Today, more than one hundred countries apply cGMP codes.[30]

Other clever objects abound. Pharmacists fondly remember romantic historical objects from Victorian times. Containers with ribs, sandpaper and even bells warned of poisonous contents. Sieves retained larger particles than their grid holes. Pastille moulds, lozenge and pill cutters, even pessary moulds for horses, knew how to deliver what their names advertised.[31]

Medicine bottles were ribbed with horizontal lines so that liquid descending from one line to another comprised one dose. Since around 1970, a dose has become the contents of a full 5 mL spoon authorised by the UK state. That spoon, by its nature (design), cannot contain more. Excess would overflow.

Dispensed medicines should not be over-congested on counters. In 1795, the rules 'Instructions for apprentices' applied in Borlase's chemist shop (that still exists as the Peasgood Pharmacy in Penzance, Cornwall) included, 'It is extremely important that all counters are kept free from muddles.'[32] Today sophisticated Standard Operating Procedures (SOPs) abound.

For two decades, after the health professional has left, compliance aids that meter dosage for residents within residential homes have been commonplace.[33] An extreme illustration is a motorised syringe driver that remembers to deliver an analgesic/anti-emetic mixture at a pre-determined dose rate. It does not sleep, suffer from a cold or take meal breaks.

The very physical forms of clotrimazole pessaries always suggest their destination. A GSL medicine in its pack containing an insert communicates its knowledge. Within the patient's home, there is no health professional to interpret and answer questions. Healing seems 'crystallised' within the 'self-sufficient' 'clever' object of the medicine itself.

Using its stand-alone memory, a dispensary labelling computer, commonplace since the 1980s is bright enough to warn of drug interactions. That sentinel may well warn more reliably than its human minder. The controlled drug register includes column headings that remind the writer what to record. Completion demands a pen designed to write so that alterations are obvious. A dedicated dispensing machine may accurately, rapidly, measure sugar-containing or sugar-free methadone mixture directly from a prescription.

Capitalising on technology used for a generation in the automobile industry, hospital pharmacists now routinely trust dispensing robots, such as the pair at the James Paget Hospital, Great Yarmouth.[34] Robots are brainy enough to recognise a jumbled pile of incoming medicines from their bar codes, store them away and dispense them for individual patients more rapidly and accurately than could humans alone.

Buildings

In the 20th century British community pharmacies seldom offered privacy to patients. However, patient counselling areas have been ubiquitous since about 2007; they enhance acoustic privacy by their very architecture.

The dispensary is generally remote from the external door. To the pharmaceutical historian, that *geographical* journey (past, for example, aerated waters, cosmetics, condoms, healthy paediatric foods, hot water and feeding bottles, medicaments and perfumes) is heavy with *historical* traces. Patients must pass shelves and may browse them while waiting for their dispensed prescriptions, and decide that they want displayed objects sufficiently to purchase them. Pharmacy and fittings seem their own canny marketer. Ingenious pharmaceutical objects may be perceived to benefit both pharmacists and patients.

Now increasing the size of the object to a multi-storey building, the pharmacists' headquarters building (including, showcases, museum, royal charter, flag and the remnants of a library) in Lambeth, England remain no exception. This author visited shortly after demerger. He discovered that the building, the object on the same earth, entered through the same door with the same reception fixture, seemed ambivalent. It remained

Figure 1. Coat of Arms of the Royal Pharmaceutical Society of Great Britain

Figure 2. New arms of the Royal Pharmaceutical Society (Courtesy RPS)

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merged. It remained the headquarters of both the professional leadership body (Royal Pharmaceutical Society, RPS) that claimed to put pharmacists first and the governmental regulatory body (General Pharmaceutical Council) that claimed to put patients first.

This fits the theory of the founding father sociologist, Max Weber. He stated that there are three main reasons for human behaviour; a specific behaviour may have more than one reason. The first, and default, reason is instrumentality (self-interest, egotism). The second is altruism: you do it for the benefit of another.

The third is tradition,[35] the great flywheel of society. Continuation of elements of the Coat of Arms of the Royal Pharmaceutical Society of Great Britain into the new branding of the RPS is one illustration. The 'master image' of the coat of arms is a single piece of vellum (calf skin) signed at the bottom by all three Kings of Arms.[36] That vellum is a thing: an *object* held within the RPS building in Lambeth. The Coat of Arms was granted by the College of Arms, London; they were granted a charter of incorporation by Richard III in 1484. That pharmacists' coat of arms, is my final ingenious object. It is laden with pharmaceutical history. Interestingly, as shown in Figures 1 and 2 (p. 72), the (Royal) Pharmaceutical Society's 2010 '(re)branding', compared with its last official coat of arms, has lost its bearers: humans. Only objects remain.

This communication has argued that *objects* are crucial to pharmacy. Addressing historically significant samples from an eclectic, social scientific perspective is of value. Objects appear so ingeniously designed that they can be perceived to possess a 'kind of intelligence'. Objects appear to have evolved over history.

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dispensed for patients and residents from pharmacies. This may provide evidence that humans tend to be 'hard-wired' to design useful objects and that such objects do evolve.

34. A competition to decide the robots' names was held amongst local schoolchildren. The winner suggested 'Dot' and 'Dash', as in the Morse code. The first Morse message sent by telegraph line was in 1844, the year after the RPSGB gained its royal charter. The international distress signal 'SOS' (... ___ ...) was only discontinued in 1997 (Reference: Hutchinson Encyclopaedia). Electrically communicated Morse messages are associated with many heroic tales. For such communication, *objects*, such as wires, are essential.

35. Weber, M. *Wirtschaft und Gesellschaft*. 4th edn, Tübingen (translated from German 1922 and published posthumously by third wife) 1956; 1: 1-14. There is a fourth reason for behaviour that Weber only includes for completeness. It is affectivity; for example, you choose to put sugar in your coffee because you have a sweet tooth. In fact, Weber's 'afterthought' can be perceived as important for pharmacists, drugs and medicines: it can be viewed as related to the interoception in the absent body of reference 7.

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Regulations Introduced in Scottish Cities during the Fourteenth to the Seventeenth Centuries to Prevent the Spread of the Plague

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The early out breaks of the plague in Europe in 550 to 560 and again in 664 do not seem to have had a great effect on Scotland. During the first part of the 14th Century, the plague, then referred to as the Black Death or Bubonic Plague, started in the East and slowly moved westwards. Exactly how the infection made the journey into Europe is not known. Probably there were a number of routes and it is likely that infection was carried by the galleys bringing spices from the East to the ports of Genoa, Venice and Messina.[1]

It is thought that the first time the plague arrived in England was in 1348, brought by an infected sailor from Gascony, who was crew on a ship which arrived at the port of Melcombe Regis, part of Weymouth, Dorset.[2] Other Chronicles support this, although, as there were many ships from the Continent of Europe calling at English ports on an almost daily basis, there would have been more than one port through which the plague entered the country.

In 1346 Philip of Valois, King of France, wrote to David King of Scots, asking him to invade England to relieve the pressure from the English army which had won a resounding victory at Crecy. David thought it would be an opportunity to take advantage of the fact that the King of England and his son Edward Prince of Wales were in France, so formed an army and invaded England, laying waste to the country in the Borders. Unknown to David, the Bishop of Durham had raised an army with Henry Percy.[3] Many of the English Knights were waiting to go to France to reinforce the English army, but on learning of the invasion turned back to repel the invasion. The Scottish army was heavily defeated at Neville's Cross. Many of the Knights including the king were captured and the need to raise ransom moneys for their release over the next ten years bankrupted the country and led to great poverty in the North.[6]

By the end of 1349 the plague had worked its way up to the North of England. This was devastating for the population of the border area around Durham, which had been destroyed by the fighting during the invasion of the Scottish army in 1346. One suggestion is that the Scottish army was waiting to make further incursions into England. It is possible that knowing that there was infection in the English army they were waiting until it was further weakened by disease.[14] However, the Scottish army then caught the disease and dispersed throughout the country carrying the infection with them.[4] The infection subsided during the winter of 1349, but during 1350 it spread again, more severely, covering the whole country. Skene wrote that

> in the year 1350 there was in the Kingdom of Scotland so great a pestilence and plague among men as from the beginning of the world until modern times had never been heard of by man.

He relates that it was the common people that were most affected by the disease, and more than 30% of the population died. This is a conservative estimate and the numbers were probably much greater.[5]

Delay in introducing regulations

Following the 1350 outbreak, further outbreaks of plague occurred in Scotland in 1361, 1380, 1431, and a local outbreak in 1432 in the Burgh of Haddington.[13] It is surprising that no apparent action was taken to try to prevent the spread of infection.

Leprosy was known in Scotland from an early date and although it was believed to be a punishment inflicted by God, it was recognised as an infectious disease. Hospitals were founded to look after lepers and the Scottish Parliament passed legislation to control the movement of lepers. A well known directive was passed in the 12th century.[7]. This directed that if any that dwell in the Burghs of Berwick, Roxburgh, Edinburgh and Stirling contract leprosy they shall be put in the hospital. Provision was made to make a collection for those who did not have the means to feed and clothe themselves.

Lepers were segregated from the rest of the population and regulations were in force which, although they could sit at the entrance to the town to collect alms, prevented them from going from door to door. No one could allow a leper to enter his house on pain of 'full forfeit'. Episodes of the plague occurred over a period of one hundred years before any action was taken to prevent its spread. One reason given for this is because there was a real confusion about what caused the infection. It was accepted by many as a

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heavenly punishment which had to be borne; it was also thought to be connected with the seasons and that it was borne on a mist or miasma. These and other reasons could have prevented early action being taken.

Early regulations

The first mention of regulations to combat the plague, appear to be the action taken in the town of Peebles in October 1468. Instructions were issued that the four 'ports' or gates of the city were to be closed; no one was allowed to visit Edinburgh or to bring anything into the town. The walls had fallen into disrepair and they were to be built up and no one could enter the town without permission from the 'Quartermaster'.

There was a severe outbreak in Edinburgh in1498 and this caused the Edinburgh Council to bring in regulations to prevent the spread of the disease. Anyone who took in a traveller had to obtain a licence, visitors had to come in through the town gates, a 10 pm curfew was introduced, anyone bringing in food or merchandise required Council permission, and any English cloth brought into the town had to be burned. Punishments for non compliance were severe and included the confiscation of all goods and banishment.[8]

From this time onwards regulations to prevent infection were issued by many of the Burghs and they became more stringent with increasingly severe punishments. In 1499 plague was prevalent in Haddington and Peebles near Edinburgh. Regulations were introduced which commanded that dogs and pigs were to be kept in the house and if found on the street to be slaughtered. Children if found in the street were put in the stocks and whipped. All trading booths were to be closed on pain of their goods being confiscated, but as Leith was free of plague at that time, food and grain could be bought from there.[9]

It was at this time that cleaners were appointed whose task was to wash and smoke infected houses. This was followed by additional regulations introduced in 1500. Goods from an infected house should be taken out and washed with water at the Water of Leith and smoked. Otherwise the goods would be destroyed. Servants could not buy clothing without their master's permission on pain of branding and banishment. Anyone bringing goods into the town without permission would have his hand cut off, if a man or branded on the cheek if a woman. Members of a household with the plague had to avoid contact with others for 12 days. Further regulations introduced in 1505 required all cases of plague to be reported within 24 hours.[10]

Regulations introduced in all burghs

In 1512 the various rules and regulations were reinforced in Edinburgh. This was followed in January by a letter under the Great Seal, sent out by King James IV to all the burghs asking them to enforce regulations to prevent the spread of plague. This contained virtually the same regulations as were imposed in the city, although the quarantine periods were increased to forty days. From this time onwards rules and regulations along similar lines, continued to be introduced or amended in Edinburgh and the other Burghs in Scotland. Some punishments were increased; from 1519 it was ordained that persons coming from suspected places or entering the burgh already infected, did so on pain of death.

In October 1574 the plague was prevalent in Kirkcaldy and Leith and many of the regulations were reissued. The inhabitants of Edinburgh were forbidden to have any kind of 'traffic' with these places and their inhabitants were forbidden to visit Edinburgh. Additionally, goods could not be sent from Kirkcaldy to Leith while the plague lasted.[11]

Anyone in Edinburgh who fell sick 'whatever sickness that ever it be' must remain in their houses in accordance with the instructions of the Baillie's, on pain of death. All the city's ports were closed except the Netherbow and the Westport. They were to be open from 6.00 am until 6.00 pm and the gates were to be guarded by a watch of six men. All vagabonds and idle persons had to leave the town within 24 hours.[12] John Forrest was put in charge of a team responsible for the cleansing of the goods of citizens who recovered from the plague. He was to be paid the sum of £6 monthly for this work, but if any infection occurred due to insufficient cleansing he was 'to suffer the deith theirfor', a strong incentive to succeed.[12]

By 1600 plague continued to be found in places throughout Scotland but there was no serious epidemic. An outbreak in Glasgow lasting from 1645 to 1648 was the last outbreak to be recorded in Scotland, although additional regulations to prevent its spread from England were introduced in 1665 and 1666.[8]

Conclusion

These regulations were in force from 1468 to the end of the 17th century. The punishments were severe and were carried out, the most frequent punishment being branding. The records show four adults were branded for failing to report a sick child. Patrick Gowanlock had half his goods forfeit and banished for failing to report a woman in his house who was sick and admitting strangers. His servant Janet Cowan was branded on both cheeks and banished. There are also a number of hangings and other punishments recorded. However violent these punishments appear to us today they had the effect of controlling the spread of plague in the City.[9]

Although the Baillie's of the city did not understand how the disease was being transmitted, the action they took was effective. Confining the sick to their houses was important. Information on outbreaks of plague in the surrounding district was used to stop the exchange of goods and the population was stopped from visiting towns where the plague was raging. The closing of schools and colleges helped to prevent the spread of infection and the action taken to appoint cleaners to fumigate and wash infected goods and premises was a sensible act.

The measures introduced by the Council of Edinburgh helped to curtail the spread of infection into

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and within the city. It enabled the life of the city to continue, even during the more severe outbreaks of the disease and its example was followed by other burghs to limit the spread of infection to other parts of the country.

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Major Accessions to Repositories in 2009 Relating to Pharmacy and Chemistry

Local

Ayrshire Archives, Watson Peat Building, Auchincruive, Ayr KA6 5HW. Nobel's Explosives Co Ltd, explosives and chemical manufacturers, Ardeer: additional records 20th cent

Isle of Wight Record Office, 26 Hillside, Newport, Isle Of Wight PO30 2EB. Nicholson Ltd, chemist and photographic supplier, Ryde: business records (unfit for production) 20th cent (2009/031)

Norfolk Record Office, The Archive Centre, Martineau Lane, Norwich NR1 2DQ. W Caxton, herbalist, Norwich: notebook mid 19th cent (ACC 2009/251)
Francis Cupiss, chemist, printer and veterinary surgeon, Diss: in-letters 1855 (ACC 2009/228)

Portsmouth Museums and Records Service, Museum Road, Portsmouth PO1 2LJ. AH Barber, chemist, Southsea: sale of poisons register (2297A)

Surrey History Centre, 130 Goldsworth Road, Woking
Surrey GU21 6ND. Ripley Pharmacy: papers rel to penicillin production 1944-99 (8468)

Walsall Local History Centre, Essex Street, Walsall, Staffordshire WS2 7AS. Wilcox Chemist, Walsall: prescription books 1949-1987 (1428)

Wigan Archives Service, Leigh Town Hall, Civic Square, Leigh, Wigan WN7 2DY. Stotherts Limited, chemists and mineral water manufacturers, Atherton: records 1904-61 (2009/3)

York City Archives Department, Art Gallery Building, Exhibition Square, York YO1 7EW. Bleasdale Ltd, manufacturing and wholesale chemists, York: records incl book of products, share receipts 1894-1897 (Acc 1009)

National

Jersey Archive, Jersey Heritage Trust, Clarence Road, St Helier, Jersey JE2 4JY. Boots Co Ltd, pharmaceuticals manufacturers and retailers, St Helier, Jersey branch: prescription book 1907-1912 (JA/1571)

University

Edinburgh University Library, Special Collections, Centre for Research Collections, Main Library, George Square, Edinburgh EH8 9LJ. Thomas Charles Hope, chemist: further papers (E.2008.3)

London University: King's College Archives, King's College London Archives, Room 302, Strand Building, Strand, London WC2R 2LS. Chelsea College: Department of Biochemistry papers 1971-1989 (Acc 1905)

Manchester University: John Rylands Library, 150 Deansgate, Manchester, M3 3EH. Sir Edward Frankland, chemist: additional family and professional papers (2009/005)
Harold Jackson, pharmacologist: student notebooks and laboratory notes (2009/025)

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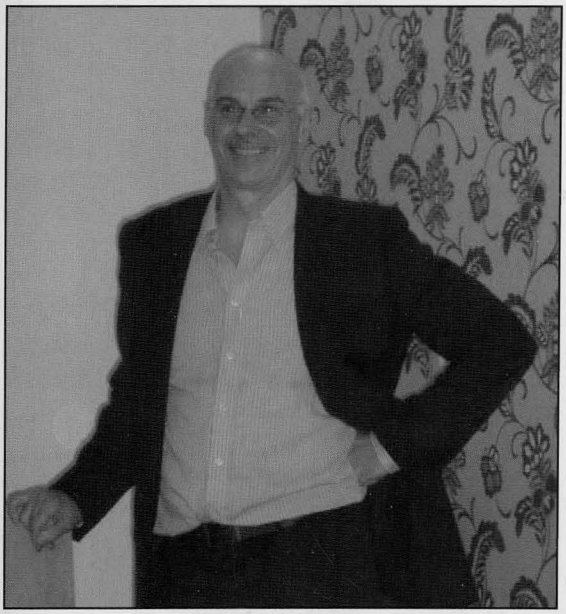

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Left: Professor Nick Barber before the September lecture at the Royal Pharmaceutical Society, Lambeth.

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